INDUSTRIAL MEDICINE AND SURGERY

Volume 22 DECEMBER 1953 Number 12

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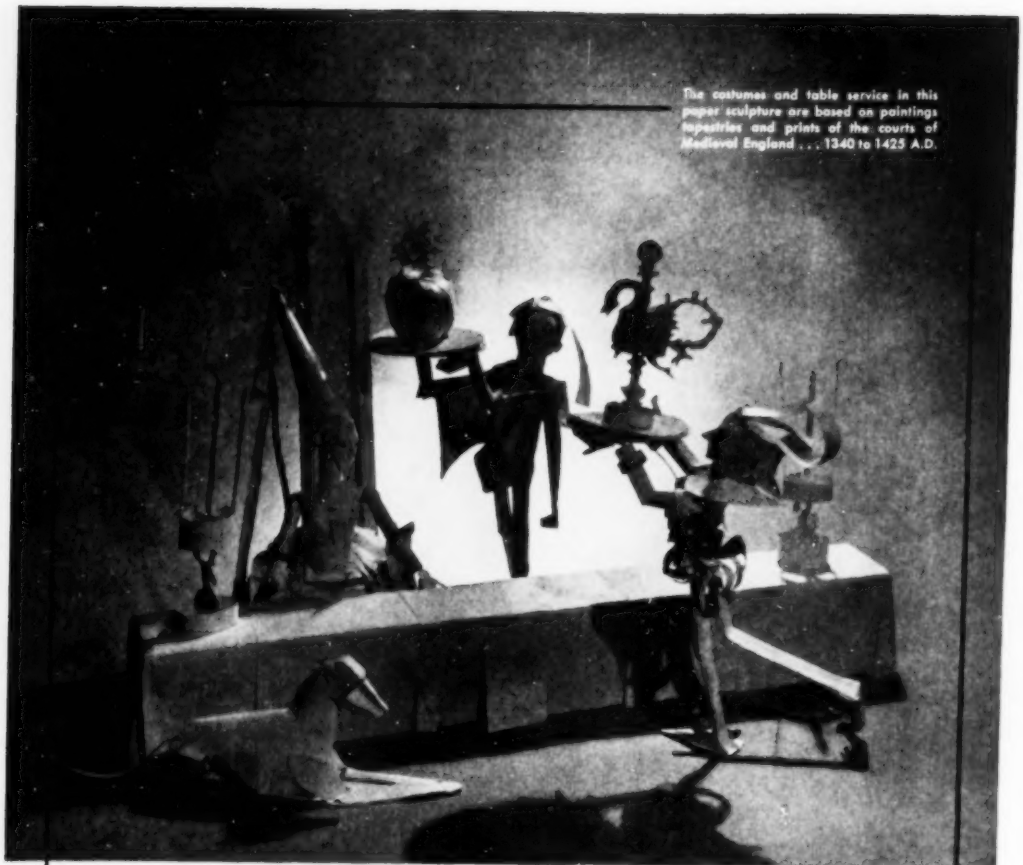

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1. Tebrock, H. E.: M. Times 79:760, 1951.

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N. K. BENTON, M.D., retired on October 1, 1953, from active duty after many years with the Western Union Telegraph Company in New York City. PAUL K. RAND, M.D., on the same day, was appointed Medical Director. DR. RAND was formerly identified with the Travelers Insurance Company of Hartford, Connecticut.

PAUL D. HALLEY, Associate Director of the Bureau of Industrial Hygiene, West Virginia State Department of Health, has been appointed Industrial Hygienist for the Standard Oil Company of Indiana, with headquarters in Chicago. He will be attached to the Medical Department of the company and will be in charge of the development of an industrial hygiene program. The assignment includes all of the Standard Oil Company of Indiana operations in 15 midwestern states, from Indiana to Wyoming and from North Dakota to Missouri.

EMMETT B. LAMB, M.D., Indianapolis, has been awarded a "Citation for Outstanding Service" by the Governor's Committee for Employment of the Physically Handicapped. DR. LAMB has been President of the Central States Society of Industrial Medicine and Surgery, and is now on its Board of Governors.

AMERICAN Association of Industrial Nurses has established its own *Industrial Nurses Journal*. This was evolved from the previous *AAIN Newsletter*. The first issue of the new journal appeared in October, 1953. It is available to industrial nurses through AAIN membership; annual dues $10.00.

UNIVERSITY of California, Stanford University School of Medicine, the San Francisco Medical Society, and the Western Industrial Medical Association were sponsors of Seminars in Occupational Health given by the U.C. University Extension, October 14-21, and November 4, 1953, at San Francisco. The faculty specialists in Occupational Medicine were DRS. RODNEY R. BEARD, CHRISTOPHER LEGGO, RUTHERFORD T. JOHNSTONE, LEON LEWIS, CHARLES HENRY HINE, JOHN KIRKPATRICK,

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and BERNARD TEBBENS. The other members of the faculty included distinguished physicians and specialists in industrial medicine, industrial hygiene, safety, compensation, and rehabilitation.

LIBERTY Mutual Insurance Company was the recipient of the Industrial Health Award of the Houston Chamber of Commerce for "outstanding contribution in the field of industrial health," presented October 1-3, 1953, at Houston, Texas. WILLIAM H. SEYMOUR, Vice-President and Manager, Loss Prevention Department, Liberty Mutual, accepted the Award for his company. From the citation: "Liberty Mutual Insurance Company is known for its significant contributions to the rehabilitation of those whose skills and abilities would otherwise be lost to industry. The rehabilitation centers it maintains and the activities of its corps of specialized workers are continuously restoring medical losses to industry. In so doing they succeed as well in restoring to the handicapped the incalculable benefits of self-reliance that come with the opportunity to earn a living once again. Important as this is to all concerned, it is equally important to industry thinking, with the result that this activity has become increasingly important in industrial health. If this were all, it would still merit our award for outstanding accomplishment in industrial health. Actually, the accomplishments of Liberty Mutual Insurance Company in rehabilitation are but an outward expression, although an outstanding one, of the basic motivation of all of the efforts of this company in industrial health. These accomplishments indeed express a philosophy in human relations which has come to be known by a special and altogether appropriate term, 'HUMANICS': Liberty Mutual's own watchword, since it includes the entire area of health practices in industry where human interests are concerned. Accordingly we find Liberty Mutual's philosophy expressed in a large and active department within its organization, a department for the development of improved practices in human engineering — humanics, indeed — in which problem research for all forms of medical loss prevention takes equal place with interest in rehabilita-

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tion. It is, then, for these positive developments in the field of human engineering that the Houston Chamber of Commerce takes pride in honoring the achievements of the Liberty Mutual Insurance Company in industrial health."

TWO members of the Committee (on Industrial Health, North Carolina) at the invitation of DR. W. P. RICHARDSON, of the University of North Carolina, attended conferences with DR. LEONARD J. GOLDWATER and DR. ROBERT A. KEHOE at Chapel Hill. These meetings were of the nature of consultations preparatory to the establishment of a chair on industrial medicine at the medical school at Chapel Hill. DR. GOLDWATER and DR. KEHOE were both helpful in making suggestions for the future work of the Committee.

—From the Report of the Committee on Industrial Health, in *North Carolina Med. J.*, August, 1953.

Tropical Disease Clinic

F. P. GUIDOTTI, M.D., Medical Director of the New York Hotel Trades Council and Hotel Association Health Center for 35,000 union hotel employees, announces the opening of a tropical disease clinic for diagnosis and treatment. This clinic is under the supervision of Dr. Frederick Van Assendelft, expert on tropical diseases. At the present time, the Puerto Rican population of New York City is about 400,000. The great majority of these have been moved from a tropical climate and environment to a more temperate and hygienically different zone within the last five years. They brought with them several illnesses, mainly tropical in na-

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Kountz, W. B.: Ann. Int. Med. 35:1055, 1951.

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ture. Several of these illnesses may be transferred to others, such as amebiasis. Others may remain dormant for many years but potentially dangerous, such as Bilharzia and hookworm infestation. Still others may remain unrecognized for a long time, severely impairing the labor capacity and employability of the patient. Recently a study was made among a large group of Puerto Rican patients seen at the Hotel Health Center in which 20% showed the existence of one or more parasitic infestations. Owing to the high incidence of parasitic infestation found, the Tropical Disease Clinic was opened, at the Hotel Health Center, where stool examinations, diagnosis and treatment will be rendered—rather than referring the patients to the two existing tropical disease centers supervised by the New York City Department of Health. DR. GUIDOTTI also announces the establishment of a Foot Clinic under the jurisdiction of the Orthopedic Service. From July 9 to October 1, 1953, 390 patients were treated in the Foot Clinic. Approximately 85% of this group, representing mainly waiters and waitresses whose work demands long hours of standing, suffered from disorders of the feet.

Minnesota Academy

THE MINNESOTA ACADEMY OF OCCUPATIONAL MEDICINE AND SURGERY was organized at Minneapolis, October 1, 1953, with an initial membership of 52 physicians and surgeons interested in and engaged in industrial medical practice. The purpose of the Academy is to bring its members together for presentation of papers and informal discussions of mutual interest in the field of occupational medicine and surgery. The following officers were elected: President, WILFORD E. PARK, M.D., Industrial Physician, Minneapolis Health Department; Vice-President, JOHN F. SHRONTS, M.D., Medical Director, General Mills, Inc., Minneapolis; Secretary, LESLIE W. FOKER, M.D., Minneapolis; Recorder, HERMAN E. DRILL, M.D., Hopkins, Minnesota; Treasurer, JAMES R. FOX, M.D., Minneapolis; Executive Board Members: EDWIN G. BENJAMIN, M.D., (two-year term), and LEONARD S. ARLING, M.D. (one-year term), both of Minneapolis. The organization meeting was followed by a dinner at the Minneapolis Club, after which a movie and paper were presented by DR. ROBERT E. PRIEST on the subject of "Occupational Hearing Loss."

Annual Meeting A.P.H.A.

AT THE annual meeting of the American Public Health Association in New York City, November 9-13, 1953, PROFESSOR WARREN A. COOK, of the School of Public Health and the Institute of Industrial Health at the University of Michigan, was made Chairman of the Section on Industrial Hygiene. Other officers elected for the coming year are: DR. CARL A. NAU, Professor of Preventive Medicine and Public Health of the University of Texas, Vice-Chairman, and DR. CLYDE M. BERRY, Industrial Hygienist of the Esso Standard Oil Company, Linden, New York, Secretary. The retiring chairman in his chairman's address presented to the Section a history and significance of "Diatomite Pneumoconiosis" in the United States. Lung cancer, as a result of air pollutants—from the general atmosphere, from occupational exposures, and from cigarette smoking—dominated the discussions at the 1953 sessions. Although there was a consensus that lung cancer is on the increase in the United States, at this time it is not possible distinctly to charge this increase to any damaging agent. The 1954 sessions of the American Public Health Association will take place in Buffalo, New York.

Bound Copies

AS THE result of several requests, we have a few copies of *Industrial Medicine and Surgery* for October, 1953, (Anniversary Number), in hard binding, priced at $5.00.

Almanac

DR. LEGGE'S Almanac for October, 1953, which was omitted from the Twenty-First Anniversary Issue, may be obtained from DR. ROBERT T. LEGGE, Six Roble Road, Berkeley, California. This for those who want to preserve the continuity of the series.

Recent Deaths

JOHN M. WILCOX III, M.D., 46, August 14, 1953, at Cleveland. DR. WILCOX was born April 22, 1907, in Cleveland; was a graduate of Adelbert College and Western Reserve School of Medicine. After serving at St. Alexis Hospital in Cleveland as a house physician, he was Assistant Executive Vice-President of the New Product Department of E. R. Squibb and Sons from 1934 until 1940. The following year, he was Director of the Product Development Division of Vicks Chemical Company. From 1942 until 1945, he served as a flight surgeon in the 11th Air Force U.S.A.F., and in 1946 became Medical Director of the Socony Vacuum Company, where he served one year. From there, he went into the practice of medicine in Pitman, New Jersey, and was actively engaged in that field up to the time of his death. He had been a member of the Industrial Medical Association since May, 1942.

CRIT PHARRIS, M.D., 52, Supervisor of the Health and Safety Section of the Personnel Department at the United Aircraft plant in East Hartford, Connecticut, at the Hartford Hospital July 30 of cardiac disease. DR. PHARRIS will be a great loss to industrial medicine in Connecticut.

—*Connecticut State Med. J.*, September, 1953.

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♐ = Sagittarius — November 23-December 22

1953 DECEMBER

December

How bless'd, how envied, were our life,
Could we but scape the poulterer's knife!
But man, curs'd man, on Turkeys preys,
And Christmas shortens all our days:
Sometimes with oysters we combine,
Sometimes assist the savory chine;
From the low peasant to the lord,
The Turkey smokes on every board."
—Gay—Fables

☽ 1st Quar. ○ Full Moon ☾ 4th Quar. ● New Moon

1 ♐ Tu
1952—Edwin Hodge Crabtree, Chief Surgeon for the San Diego Gas & Electric Company, died.
1802—John D. Corrigan, the famous Irish physician, born. Discovered the water hammer pulse.
"Wonder is the first cause of philosophy"—Aristotle

2 ♐ W
1742—Karl Wilhelm Scheele, distinguished apothecary and chemist, born at Koping, Sweden. Independent discoverer of oxygen, Scheeles Green, ammonia, and hydrochloric acid.
"It is easier to smash an atom than a prejudice"—Alfred J. Marrow

3 ♐ Th
1888—W. F. von Oettingen, chief industrial toxicologist, U.S.P.H.S., born at Marburg, Germany. Specialist in researches of chemical effects on the physiology of tissues and organs.
"The remedy is worse than the disease"—Bacon

4 ♐ Fr
1680—Thomas Bartholin, a Danish anatomist and physician, Professor at University of Copenhagen, who discovered and named the Bartholinian gland, died.
1794—The School of Sanitation authorized at Paris, France.
"Wisely and slow; they stumble that run fast"—Shakespeare

5 ♐ Sa
1776—Conrad J. M. Langenbeck, a German anatomist and surgeon, professor at Gottingen and Surgeon General of the Hanoverian Army, born at Horneburg, Prussia. Devised iridocleisis for artificial pupil.
1910—Christian H. Herter died at New York City.

6 ● ♑ S
1899—Carl M. Peterson, Secretary of the Council on Industrial Health, A.M.A., born at Rockford, Illinois.
1799—Joseph Black, Professor of Medicine, University of Glascow, celebrated chemist, discoverer of carbonic dioxide, died at Edinburgh.

7 ♐ M
1882—Theodor Schwann, Professor of Anatomy at Liege, distinguished physiologist, founder of the cell theory, discoverer of pepsin, born at Neuss, Prussia.
1787—Johannes E. Purkinje born. Hungarian physiologist; discovered the Purkinje cells.

8 ♐ Tu
1785—William Withering, 1741-1799, used, clinically for the first time, digitalis successfully in cardiac dropsy.
"A man's own observation, what he finds good of, and what he finds hurt of, is the best physic to preserve health"—Bacon

9 ♐ W
1898—Harold A. Vonachen, recipient of the Knudsen Award, Ex-President of I.M.A. and Medical Director of Caterpillar Tractor Company, born at Peoria, Illinois.
1864—Harley L. Krieger, Medical Director, Ford Motor Company, born at Haggerville, Ontario.

10 ♐ Th
1899—Earl F. Lutz, Associate Medical Director, General Motors Corporation, born at Caledonia, Michigan.
1902—Ronald Ross, medical officer in the Indian army service, awarded the medical Nobel Prize at Stockholm.
"The physician heals, Nature makes well"—Aristotle

11 ♐ Fr
1844—John M. Riggs, of Hartford, Connecticut, prominent dentist, extracted teeth for the first time under nitrous oxide anesthesia in Dr. Horace Wells' office. He named pyorrhea "Riggs disease."
"Physicians, of all men, are most happy"—Quarles

12 ♐ Sa
1882—George D. Lyman, pediatrician, Stanford University Medical School, born at Virginia City, Nevada. Renowned writer and collector of California. Author of "John Marsh," and "Saga of the Comstock." Died July 26, 1949.
"The medicine increases the disease"—Virgil

13 ☾ ♑ S
1565—Conrad Gesner, a Swiss naturalist, died at Zurich. Author of the Bibliotheca Universalis, and Historia Anamalium considered the basis of modern zoology.
1832—Albert B. Prescott, M.D., Professor of Chemistry, University of Michigan, born at Hastings, New York.

♑ = Capricorn — December 23-January 20

14 ♐ M
1873—Louis Agassiz, Ph.D., M.D., celebrated U.S. naturalist, died at Cambridge, Massachusetts. He promoted training in biology as a basis for technical medical study.
1883—Ellis Calvin, Dean and Professor of Clinical Medicine at Harvard, died.

15 ♐ Tu
1877—Nenian Pinkney, Medical Director, U.S.N., Surgeon to Fleet Admiral David D. Porter, died.
1837—Philip Syng Physic, Professor of Surgery, University of Pennsylvania; President, Academy of Medicine; called Father of American Surgery, died at Philadelphia.

16 ♐ W
1924—Frederick Trendelenburg, famous German surgical genius in plastic and bone surgery, died at Nikolasie at the age of 81.
"Everyone is as God made him, and oftentimes a great deal worse"—Cervantes

17 ♐ Th
1853—Emile Roux, a celebrated French bacteriologist, born at Confolens, Charante. Became Director of the Pasteur Institute in 1904; collaborated with Pasteur in the study of hydrophobia and researches with respect to tetanus and diphtheria.

18 ♐ Fr
1807—Augustus L. Warner, born at Richmond, Virginia, first Professor of Surgery at Hampden, Sidney College, later to become the Medical College in Virginia.
1865—The Thirteenth Amendment, abolishing slavery in the U.S., ratified.

19 ♐ Sa
1868—Usher Parsen, U.S. Naval Surgeon and historian, died at Providence. Veteran at the Battle of Lake Erie with Commodore Perry. Recipient of the Congressional Medal.
1925—Eugen Fraenkel, Professor at Hamburg, celebrated pathologist, died.

20 ○ ♑ S
1879—Thomas A. Edison demonstrated discovery of incandescent lamp. Made it possible to develop the cystoscope and urology.
"Our prayers should be for a sound mind in a healthy body"—Juvenal-Satires

21 ♐ M
1952—Walter von Brunn, who succeeded Henry E. Sigerist as Professor of the History of Medicine at Leipzig, died. Published a monograph on Guy de Chauliac, the great surgeon of the Middle Ages.
"Physician, heal thyself"—Luke

22 ♐ Tu
1590—Ambrose Pare died at Paris. He founded scientific surgery. Introduced the ligature. His classic book was published in 1561.
"Sickness is a belief, which must be annihilated by the divine Mind"—M. B. Eddy

23 ♑ W
1883—Raymond Hussey, Scientific Director, Council on Industrial Health, A.M.A., born at Greensboro, North Carolina. Died at Chicago April 15, 1953.
"Diseases of the mind impair the bodily powers"—Ovid
"Nothing can be done at once hastily and prudently"

24 ♑ Th
1894—Rutherford T. Johnstone, of Los Angeles, born at Pittsburgh, Pennsylvania. Member of the Council on Industrial Health, A.M.A.; Clinical Professor of Industrial Medicine, U.C.L.A.; Ex-President Western I.M.A.; author and specialist in occupational diseases.

25 ♑ Fr
Jesus Christ born at Bethlehem in Judea.
1848—George R. Fowler, a distinguished New York surgeon, born. First performed thoracoplasty; developed the Fowler position.
"Diseases crucify the soul of man"—Burton

26 ♑ Sa
1713—Percival Pott, surgeon at St. Bartholomews Hospital of his native city, London. A genius and investigator. Identified with Pott's fracture of the fibula, Pott's disease (caries of the spine); his operations for hernia, hydrocele, fistula in ano, all masterpieces.

27 ♑ S
1911—Rodney R. Beard, specialist in industrial hygiene and public health, born at Gunda, California. Past-President Western Association Industrial Medicine; Professor Public Health at Stanford, and Clinical Professor of Occupational Medicine at University of California.

28 ☽ ♑ M
1809—John S. Bobbs born at Green Village, Indiana. Performed the first cholecystotomy in the U.S.
"And as in men's bodies, so in government, that disease is most serious which proceeds from the head"—Pliny the Younger

29 ♑ Tu
1689—Thomas Sydenham, the most famous English physician, surnamed the English Hippocrates, died in Pall Mall, London. Distinguished for his treatment of gout. One of his aphorisms: "A man is as old as his arteries."
"For of the most High cometh healing"—Ecclesiasticus

30 ♑ W
1896—Jose Rigal, M.D., a Philippine Island patriot, instigator of the insurrection, condemned and executed.
1951—John D. Ball died at Santa Ana, California; Ex-President, Western Industrial Medical Association.
"Nothing is impossible to industry"—Periander

31 ♑ Th
1668—Herman Boerhaave, who added luster to Leyden as a medical center, a great medical teacher, consultant, and experimental chemist, born near Leyden. Well educated, knew all the European languages, and author of many books.

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1. *Spies, T. D.: Influence of Pregnancy, Lactation, Growth and Aging on Nutritional Processes. J.A.M.A., 153:185 (Sept. 19), 1953, p. 189.*

"THIOSULFIL"®

brand of sulfamethylthiadiazole

The safest and most effective sulfonamide yet presented for urinary tract infections

provides these advantages...

Potent bacteriostatic activity

Rapid transport to site of infection for early and effective urinary concentration

Rapid renal clearance

Minimum toxicity

Minimum risk of sensitization

No alkalinization required

No forcing of fluids needed

GREATER SOLUBILITY + LOWER ACETYLATION = GREATER SAFETY

Now available in two dosage forms for greater convenience

SUSPENSION

No. 914—0.25 Gm. per 5 cc.
Bottles of 4 and 16 fluidounces

TABLETS

No. 785—0.25 Gm. per tablet
Bottles of 100 and 1,000

5340

Detailed literature giving complete dosage schedules is available to physicians.

AYERST, McKENNA & HARRISON LIMITED • New York, N. Y. • Montreal, Canada

Waterproof Protection
AGAINST CONTACT DERMATITIS

. . . new plasticized cream resists washing, lasts longer

INDICATIONS: Protection of skin from *industrial dermatoses*, such as sensitivity to chemicals, paints, dyes and cutting oils; *household skin allergies*, such as soap and water dermatitis and sensitivity to cosmetics, clothing dyes, solvents, cleaning and polishing agents; *professional allergies* to procaine, penicillin, detergents and various laboratory solutions; *post-surgical reactions* to excoriating body fluids; and *irritation by scratching* of dry eczematous or neurodermatitic lesions.

CONTRAINDICATIONS: None except premature application on wet, exudative lesions.

APPLICATION: Twice daily for 10 days to two weeks to build up protective layer. Continued protection can then be maintained with a single application every one or two days. Massage into skin gently and over entire area; avoid actual rubbing in any one region; smooth in until no longer visible. When used on hands, apply also under fingernails.

HOW SUPPLIED: By pharmacies in one-ounce tubes with slip-off labels; also in one-pound jars.

No need for six or eight different skin creams to suit individual conditions—with Covicone Cream, a single product provides protection against a wide variety of sensitizing agents from corrosive industrial materials to common household allergens. Resisting removal by ordinary washing, Covicone is especially useful where prolonged or continuous protection is desired, as in cases of occupational nature. Invisible, plastic-like coating maintained with infrequent applications. In vanishing cream base, Covicone is not sticky or greasy. Abbott

COVICONE
CREAM

REG. U.S. PAT. OFF.

(Abbott's Protective Skin Cream)

an entirely different slant on antisepsis

Bactericidal—and more! An antiseptic must also penetrate and diffuse to provide full and prolonged germicidal effect. Zephiran chloride is outstanding for its spreading and wetting properties—effectively reducing surface tension. Its dispersive power contributes to the reliability of Zephiran chloride as a gram-negative and gram-positive bactericidal antiseptic.

Supplied as:
Aqueous Solution 1:1000, bottles of 8 oz. and 1 U.S. gallon.
Tincture 1:1000, tinted and stainless, bottles of 8 oz. and 1 U.S. gallon.
Concentrated Aqueous Solution 12.8%, bottles of 4 oz. and 1 U.S. gallon (1 oz. = 1 U.S. gallon 1:1000 solution), must be diluted.

for antisepsis with finesse

Zephiran, trademark reg. U.S. & Canada, brand of benzalkonium chloride (refined)

ZEPHIRAN® chloride

Winthrop-Stearns Inc. • New York 18, N. Y. • Windsor, Ont.

CORICIDIN

controls colds... curbs complications

New

...complicated colds

combats secondary invaders
antibiotic + antihistaminic,
analgesic, antipyretic

...simple colds

most widely prescribed
preparation for prevention and
treatment of symptoms

...and for pain

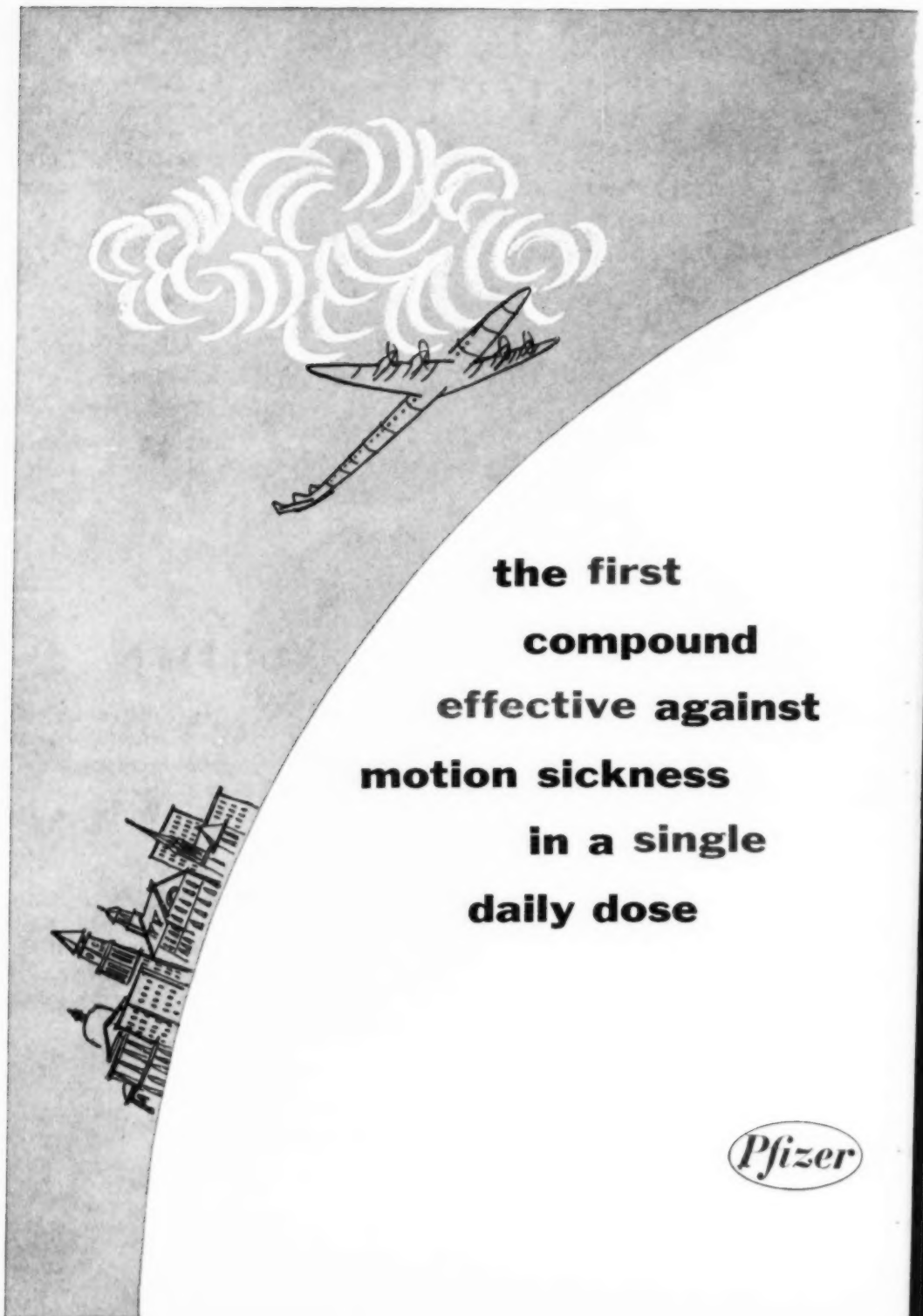
valuable in sinusitis, headache,
myalgia, neuralgia,
pleurisy, bursitis, grippe

*Subject to Federal Narcotic Regulations.

Each CORICIDIN® Tablet contains CHLOR-*TRIMETON*® Maleate, aspirin, acetophenetidin, and caffeine.

Schering

CORICIDIN



the first
compound
effective against
motion sickness
in a single
daily dose

Pfizer

with just **4** *tablets*

of new **BONAMINE**

you can travel from . . .

Boston to Bangkok—*a 2 day trip*

. . . with new freedom from airsickness

MOST PROLONGED ACTION

Bonamine is the only motion-sickness preventive which is effective in a *single daily dose.* Just two 25 mg. tablets (50 mg.) will provide adequate protection against all types of motion sickness — car or boat, train or plane — for a *full 24 hours in most persons.*

new Bonamine*

BRAND OF PARACHLORAMINE HCl

FEW SIDE EFFECTS

Clinical studies have shown, in case after case, that relatively few of the patients experienced the usual side effects observed with other motion-sickness remedies: less drowsiness, dullness, headache, dryness of the mouth, etc.

Supplied: 25 mg. tablets, bottles of 100.

PFIZER LABORATORIES *Division, Chas. Pfizer & Co., Inc., Brooklyn 6, N. Y.*

*TRADEMARK

In infectious and allergic rhinitis and sinusitis

Biomydrin "is effective as an antibiotic in clearing the nose of pathogenic organisms and purulent secretions. In many cases, sterile cultures were obtained after a brief period of treatment."

Antibiotics & Chemotherapy *3*:299 (March) 1953.

Improvement in 113 of 124 Patients*

Diagnosis	Number of patients	Improved
Chronic catarrhal rhinitis	11	11
Chronic allergic rhinitis	26	25
Right maxillary sinusitis	2	1
Chronic naso-pharyngeal catarrh	6	6
Chronic suppurative sinusitis	3	3
Coryza, Head cold, Catarrhal rhinitis	58	51
Influenza	2	1
Acute catarrh	4	3
Hypertrophic rhinitis	12	12
TOTAL	124	113 (91.1%)

* Eye, Ear, Nose and Throat Monthly *32*:512 (Sept.) 1953.

BIOMYDRIN

"BIOMYDRIN" AND "THONZONIUM BROMIDE" ARE TRADEMARKS OF NEPERA CHEMICAL CO., INC.

The Biomydrin formula

THONZONIUM BROMIDE 0.05%. Synthesized in the Nepera laboratories. Exceedingly potent antibacterial. Greatly enhances the antibiotic activity of neomycin and gramicidin. Reduces surface tension, facilitating spreading and penetrating. Mucolytic.

NEOMYCIN SULFATE 0.1%. Effective against gram-positive and gram-negative organisms.

GRAMICIDIN 0.005%. Effective against gram-positive organisms.

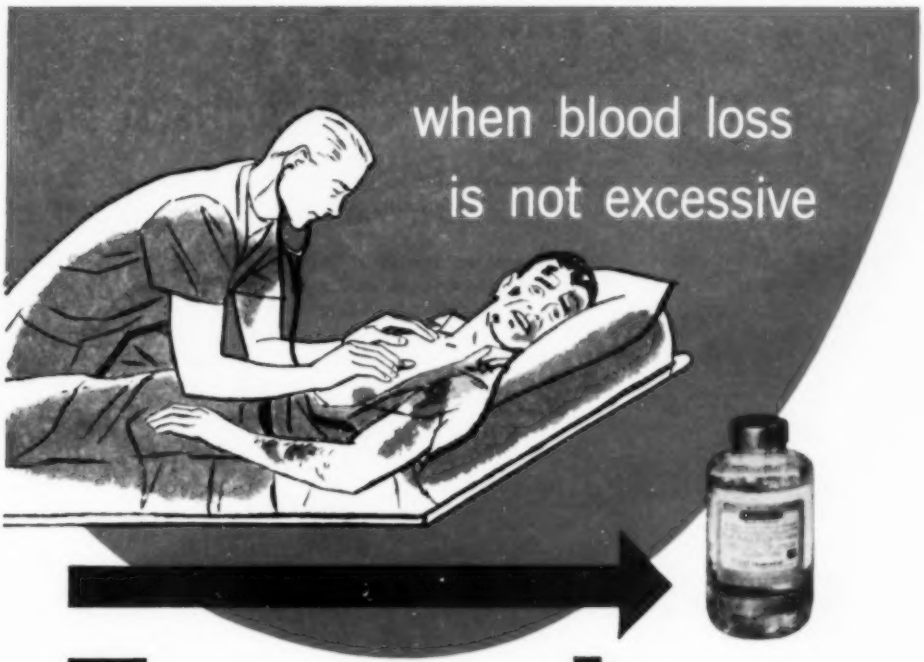
PHENYLEPHRINE HCl 0.25%. Widely preferred vasoconstrictor.

THONZYLAMINE HCl 1.0%. *Therapeutic concentration* of this effective antihistaminic aids in controlling local allergic manifestations.

- Prompt, prolonged shrinkage of nasal mucosa without secondary congestion.
- pH is 6.2. Isotonic and buffered.
- Does not interfere with ciliary activity.
- Spray covers larger area than could be reached by drops.
- Available on prescription only.

DOSAGE: Adults—2 or 3 sprays in each nostril; 4 or 5 times a day as needed, or as directed by physician. Children—1 or 2 sprays in each nostril; 4 or 5 times a day as needed, or as directed by physician.

Nepera Chemical Co., Inc. Pharmaceutical Manufacturers, Yonkers 2, N. Y.



Expandex®

(DEXTRAN) Injection 6%.

will restore effective plasma volume

without danger of hepatitis

In shock associated with surgery, trauma or burns, where blood loss is minimal or does not exceed 30%, Expandex can serve as the sole emergency means of restoring effective plasma volume. Expandex is a 6% dextran solution in isotonic sodium chloride solution. It is sterile, therefore cannot transmit the virus of hepatitis.

When Expandex is the exclusive intravenous infusion, the risk of hepatitis is completely eliminated.

This outstanding plasma volume expander is ready for immediate use, requires no refrigeration, is nonpyrogenic, and does not interfere with blood typing, crossmatching, or Rh determinations. Expandex, the first clinically acceptable dextran solution produced in the United States, is supplied in 250 cc. and 500 cc. flasks; the latter is also supplied with a sterile administration set complete with needle and airway cannula.

ACCEPTED COUNCIL ON PHARMACY AND CHEMISTRY AMERICAN MEDICAL ASSOCIATION

CSC Pharmaceuticals

A DIVISION OF COMMERCIAL SOLVENTS CORPORATION • 260 MADISON AVE., NEW YORK 16, N.Y.

introducing

A "SPRAY-ON" SURGICAL DRESSING

FOR WOUNDS,

BURNS, AND ABRASIONS

AEROPLAST

TRANSPARENT • ELASTIC • OCCLUSIVE • STERILE

EXTENSIVE STUDIES[1,2] have conclusively demonstrated Aeroplast's broad usefulness as a definitive surgical dressing. In many instances, lesions complicated by infection, and unresponsive to treatment when dressed by conservative methods, healed uneventfully when Aeroplast was substituted. Laparotomies, appendectomies, thoracotomies, ileostomies, herniorrhaphies, burns, skin graft donor sites, and compound and openly reduced fractures are typical of the broad variety of cases in which Aeroplast has been used to advantage.

1. Choy, D.S.J. and Wendt, W.E.: U.S. Armed Forces M. J. 3:1241, Sept. 1952.
2. Choy, D.S.J.: A.M.A. Arch. Surgery. *In Press.*

AEROPLAST provides new efficiency and versatility as a protective dressing for routine use in surgical and traumatic wounds, burns, abrasions, excoriation, etc.

Sprayed directly onto the lesion from a self-contained aerosol "bomb", Aeroplast dries rapidly to form a transparent, flexible, occlusive plastic film which seals contaminants out and vital fluids and electrolytes in. Biologically and chemically inert, it is non-toxic, non-sensitizing, and mildly bacteriostatic. As a replacement for conventional gauze dressings in all their varied applications, Aeroplast offers significant advantages:

AEROPLAST DRESSINGS ARE TOUGH AND FLEXIBLE. They remain in place despite friction or the stress of motion. They withstand washing. Yet they are easily removed by simple "peeling" without distress to the patient.

AEROPLAST DRESSINGS ARE IMPERMEABLE TO BACTERIA. Properly applied to aseptic lesions, sterility is maintained as long as the dressing is allowed to remain intact. In addition, Aeroplast in itself is bacteriostatic.

AEROPLAST DRESSINGS ARE SEMI-PERMEABLE TO WATER VAPOR. Normal perspiration is permitted to escape, although loss of vital fluids and electrolytes—as in extensive burns — is effectively retarded.

AEROPLAST DRESSINGS ADHERE TO ANY DRY SURFACE OF THE BODY. Regardless of location and structure or the extensiveness of the area treated, Aeroplast dressings "fit" and maintain their integrity. They do not restrict circulation, respiration, or desirable movement.

AEROPLAST IS NON-TOXIC, NON-SENSITIZING, NON-ALLERGENIC. The vinyl resin base is inert; the film which forms is insoluble in body fluids; and the ethyl acetate-acetone solvent evaporates in seconds following application.

AEROPLAST DRESSINGS ARE TRANSPARENT. They permit critical evaluation of the progress of healing at all times without the necessity of removal and re-dressing.

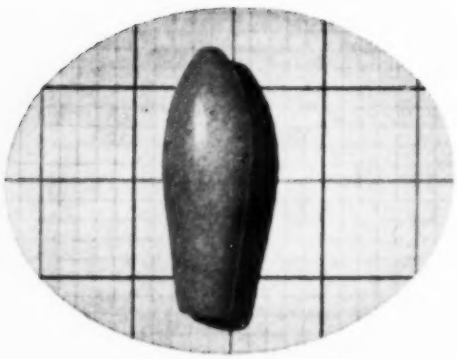
AEROPLAST Liquid Surgical Dressing is an ethyl acetate-acetone solution of co-polymers of hydroxy-vinyl chloride-acetate and sebacic acid, 9.3% by weight, and modified maleic resin ester, 3.1% by weight, with fluorochloro hydrocarbon gas as a propellant. STERILE.

Supplied in 6 oz. aerosol-type dispenser.

AEROPLAST is NOW available through your surgical supply dealer. For complete descriptive literature, write

AEROPLAST CORPORATION
420 Dellrose Avenue, Dayton 3, Ohio

DESIGNED
for easy insertion and retention



FORMULATED
for prompt relief

DEMONSTRATED
effectiveness and safety

WYANOIDS®

Hemorrhoidal Suppositories

Wyeth®
Philadelphia 2, Pa.

Also available:
WYANOID OINTMENT
tubes of 1 ounce, with rectal applicator

Upjohn

cortisone for inflammation, neomycin for infection:

Each gram contains:

Cortisone Acetate . . . . . 15 mg.

Neomycin Sulfate . . . . . 5 mg.
(equivalent to 3.5 mg. neomycin base)

Available in 1 drachm tubes with applicator tip

The Upjohn Company, Kalamazoo, Michigan

Neosone

Trademark

OPHTHALMIC OINTMENT

In a single tablet
CONVENIENT
EFFECTIVE
RAPID
control of acute upper
respiratory infections

A-P-

Finke[1], urging a more extensive use of penicillin "at an early stage of respiratory infection," states: "Nearly all minor upper respiratory infections may be precursors of more severe conditions, especially in persons with previous major respiratory episodes. Therefore, the use of antibacterial agents in the treatment of bronchitis and similar illnesses has been justly advocated as a rational measure..."

CILLIN

Each A-P-Cillin tablet combines the following proved therapeutic agents:

1 • APC—for analgesic and antipyretic action—to relieve systemic symptoms.

Acetylsalicylic acid	2½ gr.
Phenacetin	2 gr.
Caffeine	½ gr.

2 • ANTIHISTAMINE—for local symptomatic relief, particularly from profuse nasal discharge, and for mild sedation.

Phenyltoloxamine dihydrogen citrate	25 mg.

3 • PENICILLIN—for prevention and control of secondary bacterial infections.

Procaine penicillin G	100,000 units

For the common acute upper respiratory infections, the usual adult dose is 2 tablets three times a day, best continued for at least three days. The tablets should be taken at least one hour before meals or two hours after meals. White Laboratories, Inc., Kenilworth, N. J.

—supplied in bottles of 50 and 500 tablets.

1. Finke, W.: A.M.A. J. Dis. Child. 83:755, 1952.

latest clinical report[1] demonstrates D & G Aureomycin Packing is "far superior"

Recent investigators state: "Aureomycin Packing is far superior to iodoform gauze, plain gauze or any other type of gauze packing known to us."[1] The study covered many different types of abscess, as well as postoperative and non-postoperative wound infections, from all of which 12 strains of bacteria were isolated. Untreated sterile packing and iodoform packing were used as controls.

High, prolonged antibacterial action: After 16 hours, 65.4% of the aureomycin had been utilized, and after 48 hours, 93.3%. Thus D & G Aureomycin Packing helps heal infected wounds *otherwise inaccessible to systemic antibiotics* because of the presence of an inflammatory wall with thrombosed blood vessels and a total decrease in blood flow.

No interference with wound healing: "Aureomycin and plain packing showed no impairment of growth of cells in tissue culture. . . . Iodoform showed decreased growth."[1]

Relatively non-toxic: "No significant local or systemic toxic effects were noted, nor was allergy or local skin irritation in evidence."[1] Also, "Foul odor . . . was considerably reduced."[1]

Davis & Geck, Inc.

A UNIT OF AMERICAN Cyanamid COMPANY

57 Willoughby Street D&G Brooklyn 1, N. Y.

Aureomycin Dressing

◀ *D & G Aureomycin Dressing*
helps hasten healing by controlling infection on skin graft sites, wounds, burns, rectal sites, etc. It is a close mesh 8″ x 12″ gauze liberally impregnated with a non-adherent base containing 2% aureomycin hydrochloride.

◀ *D & G Aureomycin Packing*
is a non-ravel, double-selvage sterile gauze impregnated with crystalline aureomycin hydrochloride. Available in ½″, 1″ and 2″ widths.

Request Aureomycin Packing and Aureomycin Dressing from the Surgical Supply Dealer who supplies your Davis & Geck sutures. Ask your nurse to keep these potent aureomycin aids in your treatment room. Your O.R. Supervisor has them now.

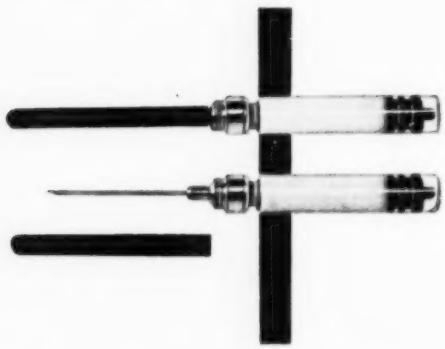
▶ Now available – new film "Aureomycin to Combat Local Infection"– send requests to D & G Film Library

Wyeth announces with pride

THE NEW

TUBEX®—STERILE NEEDLE UNIT

FOR NEW TUBEX HYPODERMIC SYRINGE



YOU SIMPLY:

1—load, as easy as loading your shotgun. Then close and . . .

2—slip off rubber sleeve, aspirate and shoot!

MEDICATION AVAILABLE IN THE NEW TUBEX—STERILE NEEDLE UNIT

(other medication will be added as production permits)

BICILLIN® Injection; dibenzylethylenediamine dipenicillin G in aqueous suspension, 600,000 units per TUBEX

BICILLIN® C-R dibenzylethylenediamine dipenicillin G, 300,000 units and procaine penicillin, 300,000 units in aqueous suspension, TUBEX of 1 cc.

LENTOPEN®; procaine penicillin G in oil with aluminum monostearate, 300,000 units per TUBEX

LENTOPEN®, All-Purpose; procaine penicillin and potassium penicillin in oil, 400,000 units per TUBEX

WYCILLIN® Suspension; procaine penicillin G in aqueous suspension, 300,000 units per TUBEX

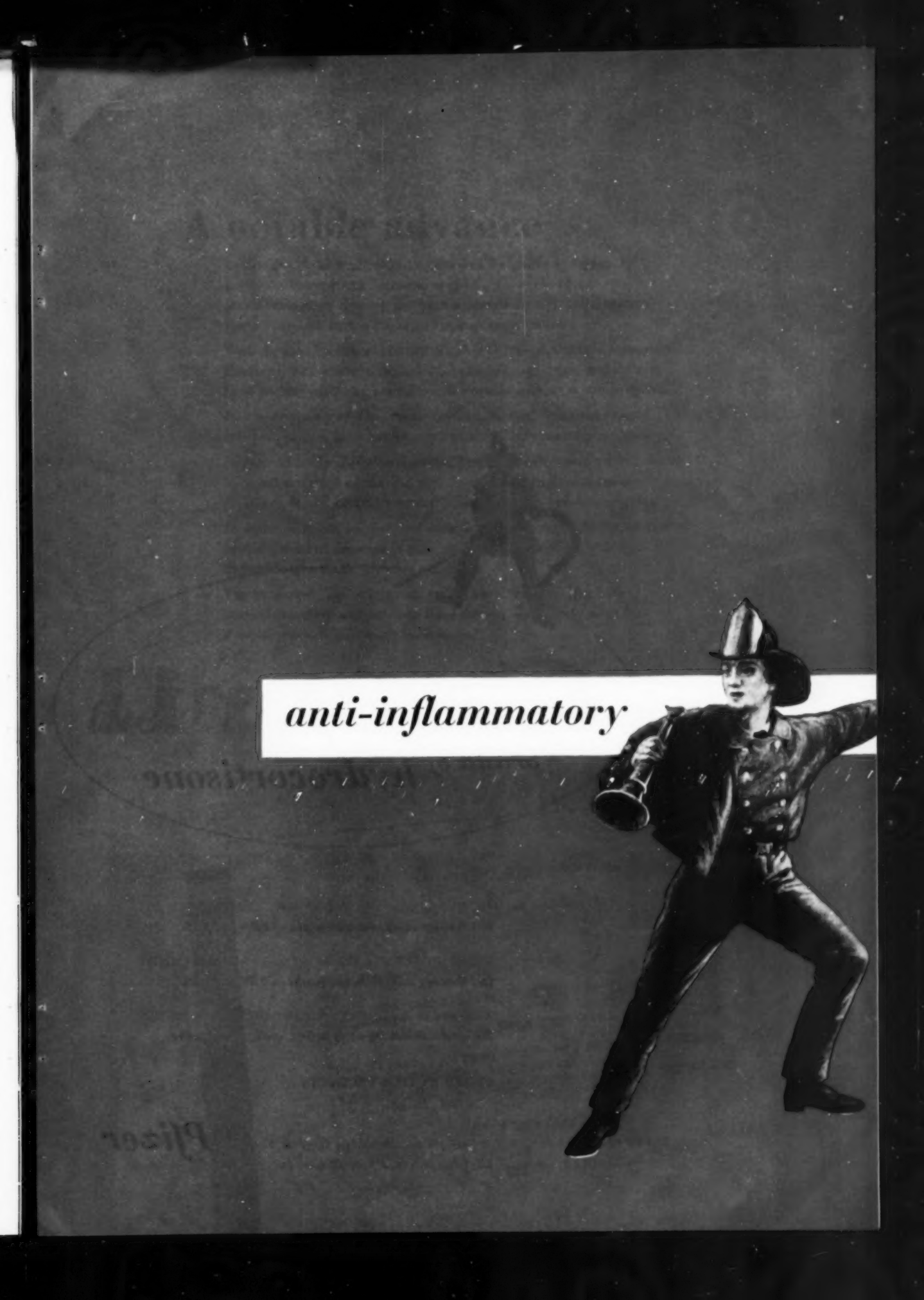
WYCILLIN® 600 Suspension; procaine penicillin G in aqueous suspension, 600,000 units per TUBEX

Supplied: packages of 10 Tubex-sterile needle units.

TUBEX take up very little space in your bag; can even be carried in the pocket—always ready for instant use—with a single syringe. See your Wyeth Detailman for a handy pocket case containing a complete line of medications for injection in the *new* TUBEX.

Wyeth

Philadelphia 2, Pa.


anti-inflammatory

Today **Cortril**

brand of hydrocortisone

CORTRIL ACETATE TOPICAL OINTMENT
in 1/6-ounce tubes in two strengths — 1.0% and 2.5%

CORTRIL ACETATE OPHTHALMIC OINTMENT
in 1/8-ounce tubes in two strengths — 0.5% and 2.5%

CORTRIL ACETATE AQUEOUS SUSPENSION
for intra-articular injection in 5-cc. vials, 25 mg. per cc.

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PFIZER LABORATORIES, *Brooklyn 6, New York*
Division, Chas. Pfizer & Co., Inc.

Pfizer

A notable advance

In this decade of medical history marked by brilliant progress in antibiotic therapy and hormonal research, a notable advance in anti-inflammatory therapy has been achieved through collaborative steroid research by the Pfizer and Syntex organizations.

With the introduction of CORTRIL Topical Ointment, CORTRIL Ophthalmic Ointment, and CORTRIL Aqueous Suspension, significant and definite local anti-inflammatory action is now possible *without systemic effects.*

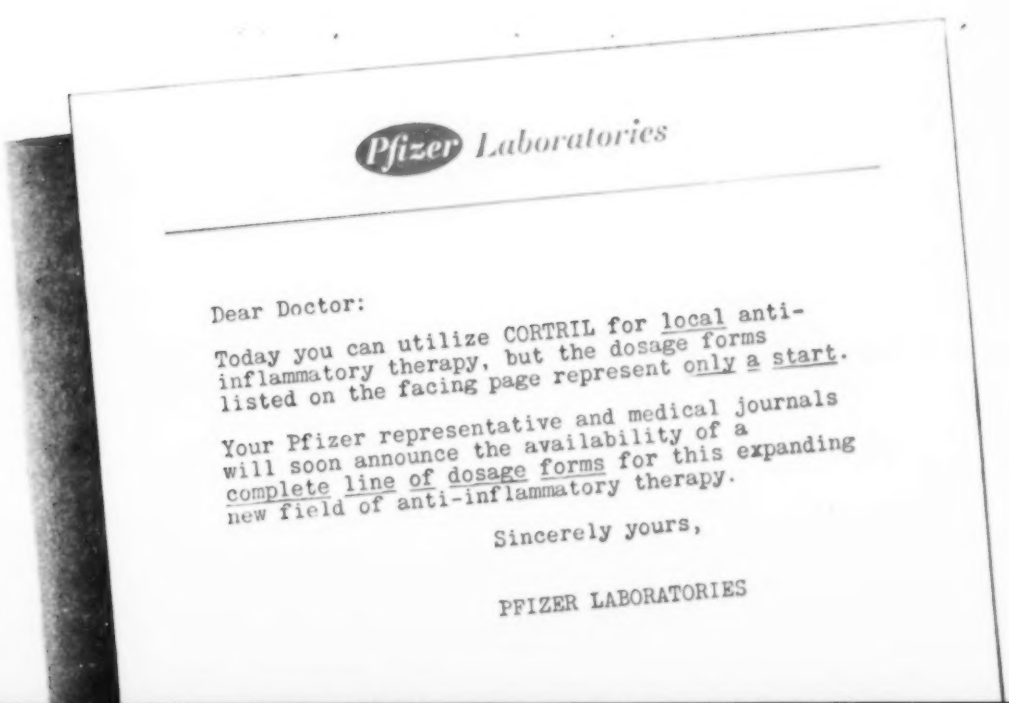
In a wide variety of dermatoses, CORTRIL Topical Ointment rapidly relieves pruritus, local edema, erythema, and inflammatory infiltration.

In external ocular disorders, CORTRIL Ophthalmic Ointment safely reduces local inflammatory edema and significantly inhibits fibrous tissue proliferation and corneal vascularization which can result in scarring.

In inflamed joints, sprains, and bursitis, CORTRIL Aqueous Suspension provides marked decrease in pain, stiffness, and swelling, entirely through local action.

The concurrent use of CORTRIL and TERRAMYCIN provides both anti-inflammatory and anti-infectious therapy — desirable as well as a useful precaution in many indications.

the anti-inflammatory hormone


Pfizer Laboratories
Dear Doctor:
Today you can utilize CORTRIL for local anti-inflammatory therapy, but the dosage forms listed on the facing page represent only a start.
Your Pfizer representative and medical journals will soon announce the availability of a complete line of dosage forms for this expanding new field of anti-inflammatory therapy.
Sincerely yours,
PFIZER LABORATORIES

insist on the genuine in the

FOIL-ENVELOPE

with genuine

SEALED-IN STERILITY

In the manufacture of 'Vaseline' Sterile Petrolatum Gauze Dressings, especially designed equipment, especially trained personnel, especially planned techniques, and especially rigid control tests assure absolute sterility. Heat-sealed foil-envelopes safeguard this sterility under all normal conditions of storage for an indefinite period. These many precautions cannot be duplicated in the extemporaneous preparation of petrolatum gauze . . . and the usual result is a dressing of uncertain sterility. Sterility is of the first order, so is its assurance.

Available through your regular source of supply

Three convenient sizes:

No. 1 – 3″ x 36″ strips (6 in carton)
No. 2 – 3″ x 18″ strips (12 in carton)
No. 3 – 6″ x 36″ strips (6 in carton)

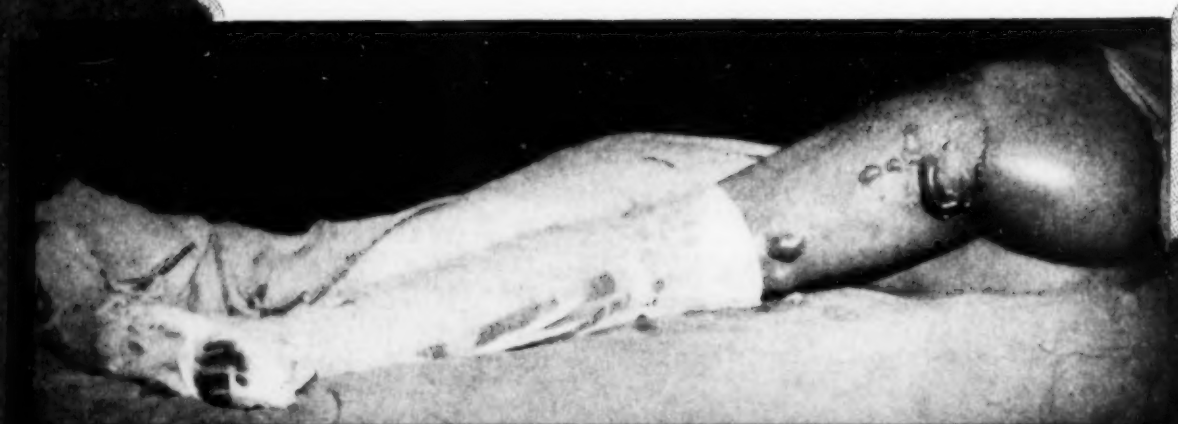
VASELINE is the registered trade-mark of the Chesebrough Mfg. Co., Cons'd

Chesebrough Mfg. Co., Cons'd
Professional Products Division
NEW YORK 4, N. Y.

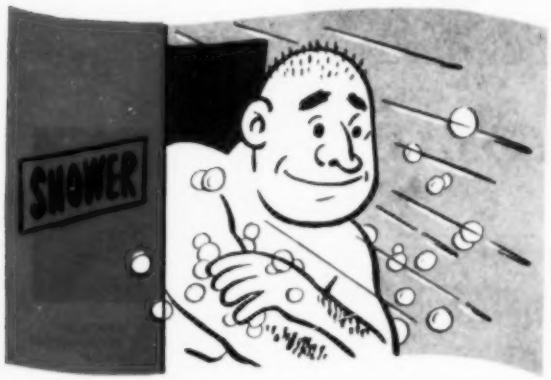
It's Always Sterile . . . Always Ready for '1001' surgical uses

Vaseline Sterile Petrolatum Gauze Dressings

TRADE-MARK ®



Four Types of Skin Cleanser Users
...and what they mean to YOU!



THE TOUGH GUY—isn't afraid of the roughest, toughest, dirtiest job in the place—and when he washes up he wants results right now! Put PAX-LANO-SAV Heavy Duty Granulated Skin Cleanser in your washrooms and watch him purr like a kitten as it whisks the greasiest, grimiest dirt away in a jiffy.

TENDER TESSIE—she isn't afraid to get her hands dirty—but when she goes home, she wants her pinkies to be pink and smooth. Millions of women workers prefer PAX-LANO-SAV Heavy Duty for heavy and light soil alike because it not only does such a fine, fast job but the famous PAX-LANO-SAV Emollient blended into every granule keeps their skins as soft and smooth as a fine hand lotion.

SLAP-DASH DANNY—if it weren't for PAX-LANO-SAV Heavy Duty's high cleansing efficiency his slap-dash wash-up technique just might get him in trouble! Authorities agree that personal cleanliness is the best protection against Industrial Dermatitis. With PAX-LANO-SAV Heavy Duty on the job even this careless character can save his skin. (His technique is not recommended, however, even with PAX-LANO-SAV Heavy Duty.)

TITUS McWAD—he's close even when you're furnishing the soap! With PAX-LANO-SAV Heavy Duty it only takes a little to do a thorough job—so he's in good shape. As Titus can tell you—a little PAX goes a long way because it makes work-roughened, hardened hands softer, smoother and progressively easier to clean.

As these four colorful characters and millions of other Regular Joes and Janes in thousands of plants all over America can tell you, nothing cleans really dirty hands so fast, so well or leaves them feeling so good as PAX-LANO-SAV Heavy Duty Granulated Skin Cleanser. The managements of those plants will tell you too, that it does this fine job for less cost. Not only less cost in compensation claims, medical expenses and lost time due to Industrial Dermatitis but actual dollar-for-dollar lower use cost. Send for a free sample today and see why so many plants everywhere are switching to

PAX • LANO • SAV Heavy Duty
GRANULATED SKIN CLEANSER

LOOK for the PAX ROOSTER *Your Assurance of a Superior Product.*

ACCEPTED COMMITTEE ON COSMETICS

When you specify any PAX Product you get as an extra dividend the experience, ability and special know-how of our PAX Research and Testing Laboratory, acquired through more than a quarter-century of continuous research and development.

Distributed Nationally Through PAX Warehouses and Jobber Trucks. Write for the Name of Your Nearest Distributor.

G. H. PACKWOOD MFG. CO.

Manufacturing Chemists

1545 TOWER GROVE AVE. • ST. LOUIS 10, MO.

PAX-LANO-SAV Heavy Duty Granulated Industrial Skin Cleanser has been awarded the Seal of Acceptance of the Committee on Cosmetics of the American Medical Association.

936

CLINICAL LABORATORY

...planning or improving a dispensary?

PHYSICAL EXAMINATION ROOM

EXAMINATION AND TREATMENT ROOM

EMERGENCY TREATMENT ROOM

RECOVERY ROOM

....let aloe help you

Modern industrial health care is increasingly concerned with the general health of employees as well as the routine treatment of the injured. If you plan to expand existing facilities or establish an entirely new department, A. S. Aloe has a planning department staffed with medical equipment experts, prepared to help you with layouts and suggested equipment lists. Our planning service is designed to save valuable time and relieve you of the burden of endless detail in preparing floor plans, check lists, etc. The illustrations above show the Aloe-equipped medical and laboratory installations of the Atlas Powder Company's plant in Chattanooga, Tennessee. Here, the employee is placed in an atmosphere equal, in every respect, to that of the private physician's office, and is therefore relieved of any possible doubt that he is the beneficiary of superior medical care. Please write for complete details.

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Pro·derna SILICONE

skin protective cream

the modern film barrier

52.5% silicone makes the difference

ONLY *Pro·derna* contains 2 to 20 times more free silicone than any other product available—chemically inert, flexible, greaseless, water and oil repellent.

prevents contact dermatitis

from: water • soap • household cleansers • wool
saliva • urine • rectal and vaginal discharge
cotton • oils • rust preventatives • fuels
inspection fluids • alkalis • acids • paints

Does not sensitize or irritate

Easily removed with LOWILA cake

Available at pharmacies in 1 oz. tubes and 1 lb. jars

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DIVISION OF FOSTER-MILBURN CO.

Anytime . . .

Anywhere . . .

Gratifying Relief

from Aggravating Urogenital Symptoms

Whenever frequency, pain, urgency and straining occur . . . wherever the patient may be . . .

PYRIDIUM swiftly secures safe urogenital analgesia in patients suffering from cystitis, prostatitis, urethritis, or pyelonephritis. PYRIDIUM is compatible with antibiotics or other specific, corrective therapy.

PYRIDIUM®

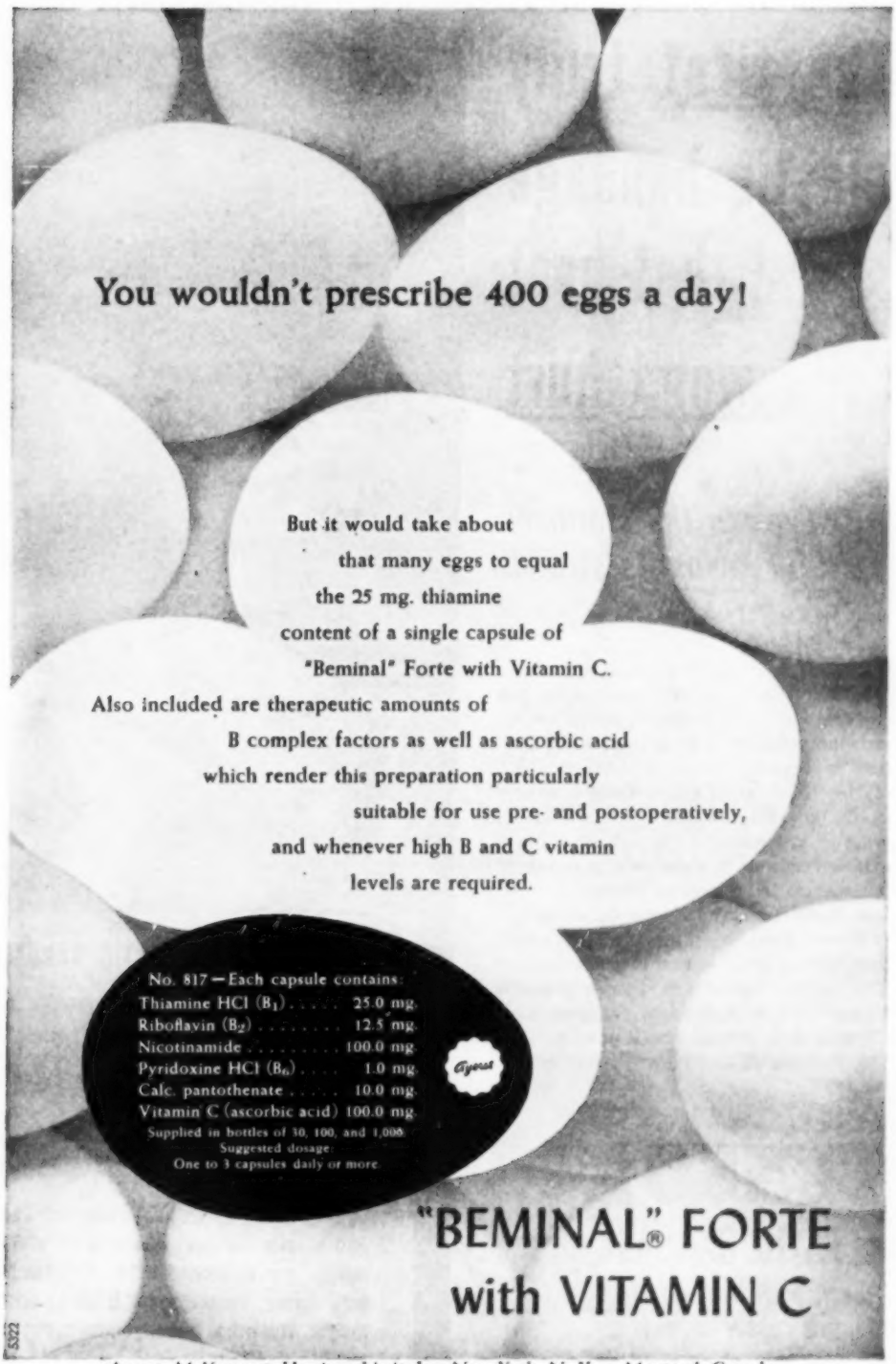
(Brand of Phenylazo-diamino-pyridine HCl)

PYRIDIUM *is the registered trade-mark of Nepera Chemical Co., Inc. for its brand of phenylazo-diamino-pyridine HCl. Merck & Co., Inc. sole distributor in the United States*

MERCK & CO., INC.

Manufacturing Chemists

RAHWAY, NEW JERSEY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Also included are therapeutic amounts of
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As you know, it takes live rubber threads to make a truly elastic bandage. But up to now live rubber has posed a laundry problem . . . a problem intensified by the regular high-temperature drying process in hospital laundries.

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New TENSOR®
ELASTIC BANDAGE
Woven with Heat-Resistant live rubber threads

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As prophylactic therapy in rheumatic fever or in the adjunctive treatment of penicillin-sensitive infections, one intramuscular injection produces blood levels lasting as long as 14 days. *Easy-to-give* Permapen Aqueous Suspension is supplied in single-dose, disposable STERAJECT® cartridges containing 600,000 units of DBED penicillin. Each cartridge comes with sterile, individually wrapped needle, ready for immediate use in your Pfizer STERAJECT syringe.

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Serpasil™

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A pure crystalline alkaloid of Rauwolfia serpentina

Serpasil, *a pure, crystalline, single alkaloid of* Rauwolfia serpentina, *produces* mild, gradual, sustained *lowering of blood pressure without undesired effects from unknown alkaloids of the whole root. Other advantages:*

- *Effective alone or in combination with other antihypertensive agents.*
- *Uniform potency.*
- *Predictable therapeutic results.*
- *No tolerance developed, or toxic effects reported; no contraindications; no serious side effects.*

Virtually every hypertensive patient may be treated with **Serpasil** *therapy. Prescribe this safer tranquilizer-antihypertensive now. Available at all prescription pharmacies.*

Serpasil *Tablets, 0.25 mg.–0.1 mg. Bottles of 100.*

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severe dermatoses . . .

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ORAL: *Tablets Cortisone Acetate, scored*

5 mg. per tablet, in bottles of 50.
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25 mg. per tablet, in bottles of 20, 100, 500.

INTRAMUSCULAR: *Sterile Aqueous Suspension Cortisone Acetate*

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THE UPJOHN COMPANY, KALAMAZOO, MICHIGAN

Page 45

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Xylocaine® Hydrochloride (Astra) merits special consideration by the busy anesthesiologist and surgeon. Profound in depth and extensive in spread, its well-tolerated effect is more significantly measured by the time saved through its remarkably fast action, by which so much normally wasted "waiting time" is converted to productive "working time".

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AN AQUEOUS SOLUTION

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*U.S. Patent No. 2,441,498

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18. Valuable in many allergy diets.

19. Belongs among foods useful in certain acute intestinal infections.

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21. Favorably influences mineral retention.

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The answer is

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If you would like

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seriously affect work and pleasure

. . . there is pain and tiredness ALL OVER

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with massage . . .

stimulates circulation, relieves pain and itching. Soothes tired feet and aids in restoring overstrained muscles.

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Samples cheerfully sent on request.

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"Lost time greatly reduced"*

by use of this analgesic for relief of moderate to severe pain

Excellent results in relieving moderate to severe pain caused by industrial disabilities is reported* in 53 percent of 104 patients receiving Phenaphen 'Robins'—a much higher degree of relief than that in a control group receiving a standard aspirin-phenacetin-caffeine preparation. Disabilities included bursitis, tendonitis, tenosynovitis, myositis, neuritis, neuralgia, myalgia, low back syndrome, abrasions, and contusions—conditions that commonly cause lost time because of the difficulty in controlling pain.

An objective of the study was to relieve pain sufficiently to reduce lost time and "still maintain a safe and efficient employe both on the job and while driving home." Not only was Phenaphen found "satisfactory for everyday industrial use," but "the amount of lost time . . . was greatly reduced." It was also concluded that "Because of the complete absence of side effects, it is justifiable to increase the medication to two tablets every four hours."

*New York St. J. Med. 53:1867, 1953.

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(The basic non-narcotic formula)

Each brown and white capsule contains: aspirin 162 mg. (2½ gr.), phenacetin 194 mg. (3 gr.), phenobarbital 16.2 mg. (¼ gr.) and hyoscyamine sulfate 0.031 mg. (1/2000 gr.).

PHENAPHEN with CODEINE PHOSPHATE ¼ gr.
Phenaphen No. 2—in black and yellow capsules

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when psychic stress

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BACK PAIN or HEADACHE

Edrisal* relieves the psychic stress

Edrisal's Benzedrine† component improves the patient's mood and creates a sense of well-being, thus relieving the depression that so often is the underlying cause of pain.

'Edrisal' relieves the pain

"'Edrisal' was more effective than any other analgesic previously used..."

Wells, R. L.: M. Ann. District of Columbia *20*:360, 1951.

Each 'Edrisal' tablet contains:

'Benzedrine' Sulfate (racemic amphetamine sulfate, S.K.F.)	2.5 mg.
Acetylsalicylic acid	2.5 gr.
Phenacetin	2.5 gr.

Be sure to prescribe 2 'Edrisal' tablets per dose to assure the full benefit of the 'Benzedrine' component.

Also available, for intense pain: 'Edrisal with Codeine ¼ gr.'

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*T.M. Reg. U.S. Pat. Off.

†T.M. Reg. U.S. Pat. Off. for racemic amphetamine sulfate, S.K.F.

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that's what physicians and patients alike call these two favorite dosage forms of Terramycin because of their unsurpassed good taste. They're nonalcoholic — a treat for patients of all ages, with their pleasant raspberry taste. And they're often the dosage forms of first choice for infants, children and adults of all ages.

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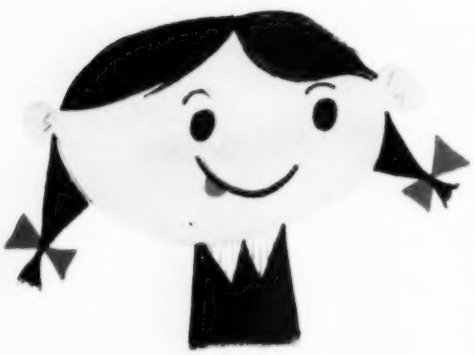

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Each cc. contains 100 mg. of pure crystalline Terramycin. Supplied in 10 cc. bottles with special dropper calibrated at 25 mg. and 50 mg. May be administered directly or mixed with nonacidulated foods and liquids. Economical 1.0 gram size often provides the *total dose* required for treatment of infections of average severity in infants.

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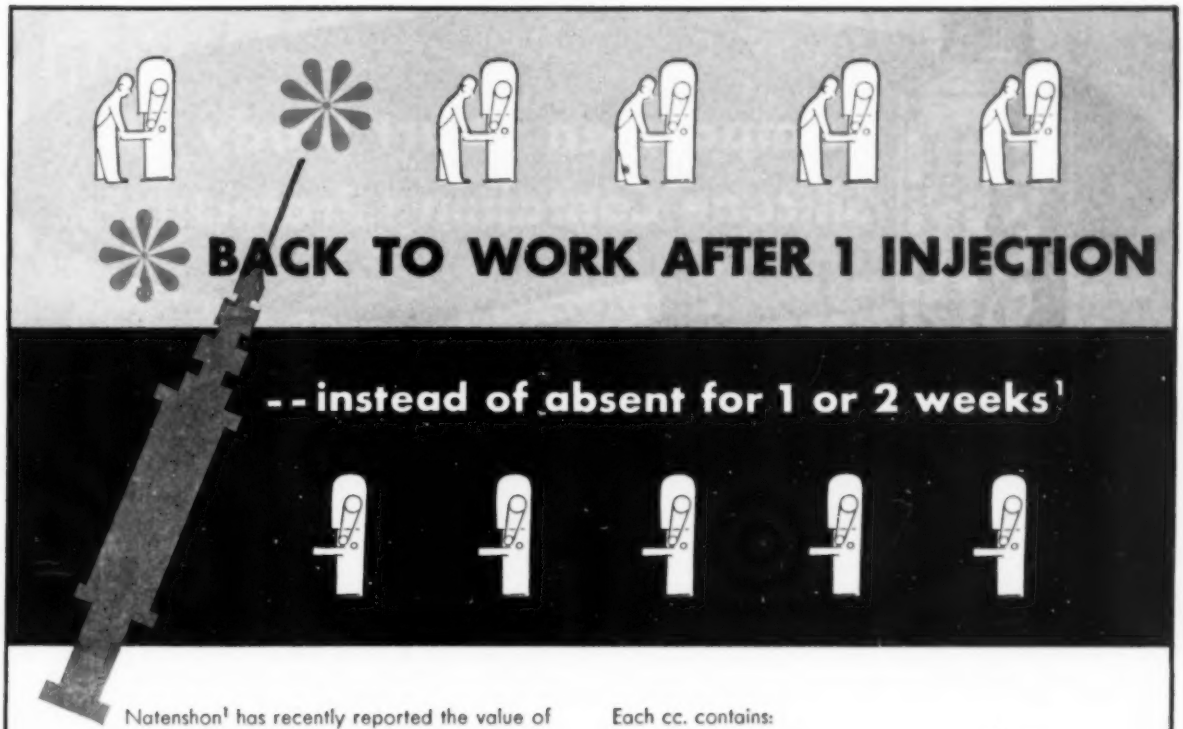

BACK TO WORK AFTER 1 INJECTION

--instead of absent for 1 or 2 weeks[1]

Natenshon[1] has recently reported the value of PHYATROMINE-H as a simple, effective office procedure for relieving pain and spasm in neuromuscular disorders. In traumatic myositis and strains, "the patient usually gets sufficient relief from one injection so that he can return to work instead of being off one or two weeks." Relief usually lasts for three days.

PHYATROMINE-H, containing l-hyoscyamine, gave a better therapeutic response with fewer side-effects than physostigmine-atropine combinations.[1] New evidence[2] confirms that hyoscyamine is twice as potent in its antimuscarinic action as atropine; it has, however, only one-half the cerebral stimulating effect,[3] and less tendency to cause mydriasis.[3]

Each cc. contains:

Physostigmine Salicylate	0.6 mg.
l-Hyoscyamine Hydrobromide	0.3 mg.

In isotonic sodium chloride solution

SUPPLIED: No.1742—1-cc. ampuls, boxes of 25; 30-cc. multiple-dose vials.

Complete Literature on Request

REFERENCES: 1. Natenshon, A. L.: M. Times 81:342, 1953. 2. Ward, J. W., et al.: Read before the American Society for Pharmacology and Experimental Therapeutics, Chicago, April 6-10, 1953. 3. Cushny, A. R.: Biological Relations of Optically Isomeric Substances, Baltimore, Williams & Wilkins Company, 1926.

STABLE..READY TO INJECT..WELL TOLERATED

Ethical Pharmaceuticals Since 1894
KREMERS-URBAN COMPANY
LABORATORIES IN MILWAUKEE

PHYATROMINE®-H

Trademark

[Brand of Physostigmine Salicylate and l-Hyoscyamine Hydrobromide]

A New Better-Tolerated Physostigmine Formula for Skeletal Muscle Spasm Due to Strains, Injuries, and Arthritis

PLEASE SEND ME:

. . . . . Professional sample vial of 5 cc. without cost or obligation.

. . . . . 30-cc. multiple-dose vials of PHYATROMINE-H at $6.30 per vial.

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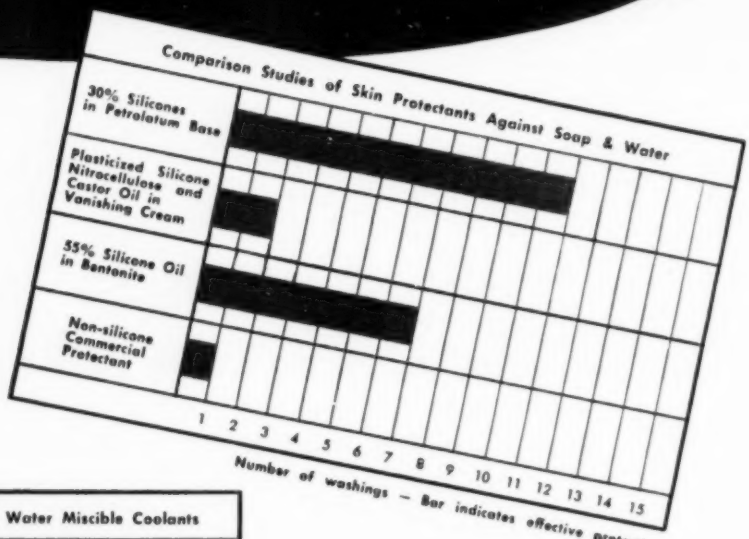
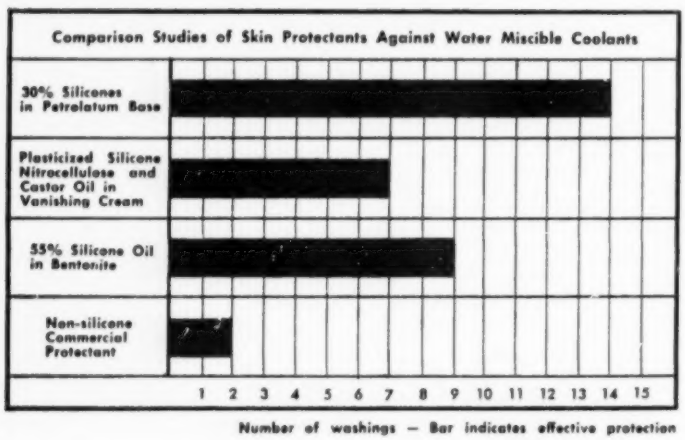
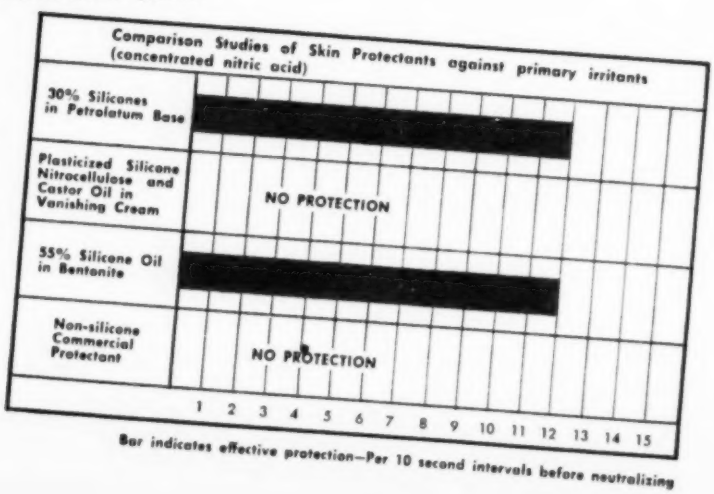
Comparison Chart Study of Silicone Containing Protectants*


Comparison Studies of Skin Protectants Against Soap & Water
30% Silicones in Petrolatum Base
Plasticized Silicone Nitrocellulose and Castor Oil in Vanishing Cream
55% Silicone Oil in Bentonite
Non-silicone Commercial Protectant
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Number of washings — Bar indicates effective protection


Comparison Studies of Skin Protectants Against Water Miscible Coolants
30% Silicones in Petrolatum Base
Plasticized Silicone Nitrocellulose and Castor Oil in Vanishing Cream
55% Silicone Oil in Bentonite
Non-silicone Commercial Protectant
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Number of washings — Bar indicates effective protection

Siladerm Skin Protectant is formulated of 30 per cent silicones in a petrolatum base. The above charts are respectfully directed to the attention of those practitioners interested in the problem of industrial dermatitis and other common dermatoses including "housewife's eczema."


Comparison Studies of Skin Protectants against primary irritants
(concentrated nitric acid)
30% Silicones in Petrolatum Base
Plasticized Silicone Nitrocellulose and Castor Oil in Vanishing Cream
NO PROTECTION
55% Silicone Oil in Bentonite
Non-silicone Commercial Protectant
NO PROTECTION
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Bar indicates effective protection—Per 10 second intervals before neutralizing

*From "A Comparison Study of Silicone Containing Protectants" from the Department of Dermatology and Syphilology, of a leading University Hospital. Copies of the above paper will be sent upon request. The Siladerm Laboratories, **Dept. A, Box 359, Oshkosh, Wisconsin**

'Industrial Back' Problem Solved!

THE STORM LAME BACK SUPPORT—How it is built—why it is built that way—WHAT IT DOES

We set forth herewith our concept of the Lame Back problem, particularly as related to low back pain and our efforts to assist the physician in his treatments. Our understanding of this problem is based, first, upon the theories of our founder, Katherine L. Storm, M.D., second, on the tremendous amount of help and suggestions from our physician friends, and third, upon the more than fifty years of cumulative effort and experience.

Our belt building is based on the following simple hypotheses:

1. Backache is a symptom
2. The symptom of a Lame Back is pain
3. Pain is due to muscle spasm

No matter which of the many causes is responsible for the low back pain, the fact remains that this area is subject to extreme leverage and weight bearing.

Acute Lame Back Prevented from Becoming Chronic

In acute lame back, caused by trauma, the Storm Lame Back Support furnishes traction towards the spine which limits the overstretched muscles and ligaments to their normal range. At the same time it allows for freedom of exercise of the abdominal lumbar muscles to milk out the effusion and hemorrhage so often associated with muscle strain. This is designed to discourage the formation of scar tissue or deposits which might cause chronic backache.

The Storm Lame Back Support substitutes for the overstretched and torn ligaments so that the normal weight bearing and motional functions of the muscles can be carried on. Following the lines of the musculature, the Storm Belt limits the strained muscles to their normal range so that exercise will not further overstretch them or the ligaments in their weakened condition.

Chronic Lame Back Gets a Big Assist

No matter which of the many causes of chronic lame back, there is tenseness and muscle spasm, resulting in pain. All Storm Lame Back Supports have a non-stretch band encircling the pelvic girdle with traction towards the spine. Under this band is the soft protecting body part and the band itself forms the foundation for the supporting back column. This band extends downward in front to protect the Hesselback Triangle, and it is arched to allow comfort in sitting position. The band is anchored at the back to keep it where it belongs. Under the band and extending upward are the firm traction-giving, canvas-interlined back pieces. These back pieces can be bent to accommodate lordosis. A pad is sometimes used for spondylo listhesis.

The body part of the belt is made of Storm Mesh, our exclusive material, knitted on our own knitting machine. This material has a 10% stretch with an 8 pound pull, without the use of deteriorateable rubber elastic. It gives a soft foundation to prevent pinching, and supports the upper abdomen to lift anterior weight without constriction.

The belt is held down in place by soft knitted thigh straps, originated by Dr. Storm, that go around the leg. Consequently, they do not cut into the groin as do other leg straps. On some women's belts we can substitute garters. This carefully made supporter does not shift, chafe or pinch. It is superior in that it is comfortable over the iliac crests and bony processes. It is washable and long wearing. The exclusive patented button fasteners provide for the most convenient adjustment.

Lame Back an Economic Problem

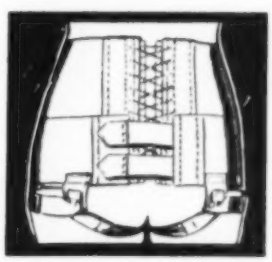
Liability, physician's time, lost man-hours, workman's welfare and efficiency all suggest reasons for the use of the Katherine L. Storm Lame Back Support. A few sizes in stock and a serious problem in factory welfare is alleviated. Won't you order a trial lot of 6 *now*, with send-back privilege if not entirely satisfied?

MIDWEST INDUSTRIAL CLINIC ORDERS 768 STORM BELTS IN TWELVE MONTHS

Prevents Loss of Man Hours

Bad News for Lawyers

"Your belt is the best we have found that can be bought at a reasonable price and fitted to most patients." Immediate application enables patients to go back to work without bed rest in most cases.



Model SA—World's leading Lame Back Support. One of our 45 models of physiological supports.

Please rush _____ Model SA Supports.

Sizes _____ (waist measures).

Chargo to us on open account. It is understood that these can be returned for credit if we so desire.

Company _____

Address _____

City _____ State _____

Ordered by _____

KATHERINE L. STORM SUPPORTS

Industrial Division—ESTABLISHED 1900

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From Veratrum Album

NEW

a NEW hypotensive agent

VERATRUM ALBUM, a species of *Veratrum* indigenous to southern Europe, yields the ester alkaloid 'Provell Maleate.' 'Provell Maleate' is many times more potent than the mixture of substances from which it is isolated. Its uniformity and purity permit better control of the hypertensive patient than is possible with mixtures of alkaloids.

Hoobler* states that protoveratrine is superior to the alkaloids from *Veratrum viride* in that blood pressure can be reduced from six to eight hours daily without producing nausea, vomiting, or tolerance to the medication. The purity of the alkaloid allows for the accurate dosage so necessary to continuing good results over extended periods of time.

Careful adjustment of the dosage schedule to fit the need of each patient is mandatory. Overdosage may result in distressing, although usually not serious, symptoms. 'Provell Maleate' is a potent drug to be administered only under the close supervision of a physician.

'Provell Maleate,' 0.5 mg., is available in cross-scored tablets (to facilitate careful individualization of dosage) in bottles of 100. Your pharmacist has it. Be sure to evaluate carefully this important hypotensive drug. Ask the Lilly representative . . . or write Eli Lilly and Company, Indianapolis 6, Indiana, U. S. A., for more complete pharmacologic and clinical data.

**Annals of Internal Medicine*, 37:465, 1952.

PROVELL MALEATE

(PROTOVERATRINE A AND B MALEATES, LILLY)

Lilly

lowers blood pressure consistently, safely

INDUSTRIAL MEDICINE AND SURGERY
DECEMBER, 1953

Fatigue— Measurement and Reduction

LUCIEN BROUHA, M.D., D.Sc.
Haskell Laboratory of Industrial Toxicology
Wilmington, Delaware

FATIGUE is a vague and general term which is applied to many different situations, produced by many factors and characterized by many symptoms. We know that physiological, and sociological influences are involved in its production, but, from a scientific point of view, there is no single precise definition of fatigue. Physical fatigue, mental fatigue and nervous fatigue are terms used by physicians, physiologists and psychologists, and the common factor which characterizes all these states is a tendency towards inactivity. Fatigue has been described as a sort of "negative appetite for activity." We may add that the "negative appetite" is usually more pronounced for the specific kind of activity that has produced fatigue and it may not exist for other kinds of activities.

Regardless of the type of fatigue considered, it can not be evaluated properly unless changes occur that can be accurately measured and that can be reproduced within reasonable limits under similar conditions. So far, numerous kinds of fatigue have escaped precise investigation because no reliable means exist for measuring them. So called "nervous fatigue" is a good example. Other kinds of fatigue such as "mental fatigue" have been evaluated more or less successfully by various testing programs which require strictly controlled experimental conditions and cannot be applied in routine industrial practice.

Numerous attempts have been made to use the variations in daily work output as an index of variations in fatigue, as in the well known experience of the Western Electric Company. One cannot escape the general conclusion that the degree of motivation rather than the degree of fatigue is estimated by that method. Fortunately, the type of fatigue produced by muscular exertion and by adverse environmental conditions can be evaluated by various methods.

Presented at the Eighth Annual Time Study and Methods Conference of the Society for the Advancement of Management, New York City, April, 1953; and published in the *SAM Proceedings*, August, 1953.

Numerous experiments have been performed to determine the physiological effects of muscular work of varying degrees of intensity. It is known that when shifting from a resting condition to one of physical activity many physiological functions change from their "resting level" to a "working level." Heart rate, blood pressure, cardiac output, pulmonary ventilation, oxygen consumption, chemical composition of the blood and urine, body temperature and rate of sweating are all modified by muscular activity. By measuring one or more of these variables during activity it is possible to determine by how much the "working level" differs from the "resting level." This gives an estimate of the degree of physiological stress experienced in performing a given task and leads to an estimate of the degree of fatigue to be expected from that task. After activity is over it is possible to follow the return of these variables to the "resting level" and to determine the duration of the "recovery period" at the end of which the individual is back to the pre-activity physiological equilibrium.

The "working level" varies according to the work load, to the environment in which the work is done, and to the physical capacity of the individual. The rate of recovery to the resting state varies also according to these various factors and it is proportional to the stress experienced during work. Consequently, by measuring the physiological stress and the time it takes to recover from it, situations leading to physical fatigue can be evaluated.

This is only a small part of the general problem of fatigue in industry. Nevertheless, considering that in a great number of jobs muscular exertion is still the main factor of fatigue, it is well worth investigating that problem. It has been demonstrated that practical improvements leading to increased work output and increased employee well-being can result from such studies, but one has to remember the limitations of the method and avoid conclusions that go beyond the facts.

Measuring the Physiological Stress

MUSCULAR activity is known to result in changes in heart rate, oxygen consumption, pulmonary ventilation, lactic acid concentration in the blood, body temperature, 17-Ketosteroid excretion in the urine, eosinophil count in the blood, and in the reaction forces produced by bodily motion.

These changes are proportional to the degree of stress, but some cannot be used to evaluate fatigue in industry because the stress is not great enough. For example, little or no increase of lactic acid is found in the blood of workers in the great majority of industrial jobs. Other methods, even though accurate, are not applicable because they require complicated apparatus which is too cumbersome to use at the job site.

During muscular activity comparable to that found in industrial jobs, a linear correlation exists between the amount of work performed and the changes in heart rate, total pulmonary ventilation, and oxygen consumption. These measurements are easy in the laboratory, but in industrial practice recording ventilation and oxygen consumption is usually found impractical.

Since numerous measurements must be collected to compensate for individual variations as well as for daily variations in the same individual, a simple technique is essential if the method is to be used routinely. Recording changes in pulse rate satisfies the above criterion and has been found to give satisfactory measurements of the physiological expenditure that is required by a given job. Fortunately, following the pulse rate variations after the job is done, when the subject is recovering from a work cycle, usually gives sufficient information. The principle of the method used in this research was developed in the Harvard Fatigue Laboratory. It consists of counting the pulse rate at one-minute intervals during the first three minutes of the recovery period after the termination of work and while the subject is sitting quietly. From these pulse rates a "heart rate recovery curve" can be constructed which indicates the actual values of the pulse and the rate of recovery toward resting level. Two conclusions can be derived from these measurements. First, for a given individual or for a given group of workers, the heavier the physiological load the higher the heart rate and the more slowly it returns to its resting level. Secondly, the better the physical condition of the individual, the smaller the increase in heart rate for a standard work load and the more rapid the return of the heart rate to its resting value. Thus, both the physiological stress and the physical aptitude of an individual for a specific job can be determined from the recovery pulse rate measurements. This is the basis of the "Harvard Step Test" which was widely used during World War II for assessing the physical fitness of Armed Forces personnel.

In addition to measuring the cardiovascular stress by counting pulse rate, medical thermometers are used to record the changes in oral temperature. It is known that body temperature increases in relation to the work load and the duration of work. Body temperature must be known in order to estimate the stress imposed upon the thermoregulating mechanisms, particularly when physical exertion is combined with heat exposure. The reading is usually taken at the end of the fourth minute following work.

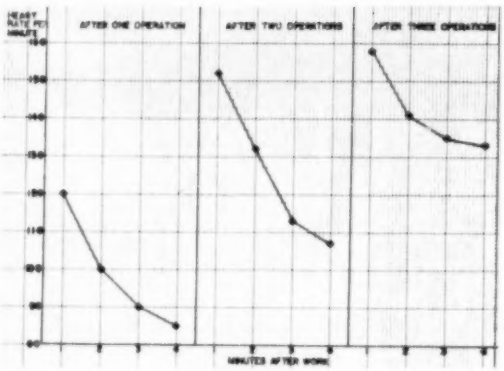

Fig. 1.
Changes in heart rate recovery curves with increasing work.

Measuring pulse rate and body temperature is technically simple. The equipment required—stopwatches and accurate medical theromometers—is inexpensive and easy to handle, and the duration of one observation is, at most, four minutes.

Factors and Physiological Evaluation

THE onset of fatigue can be predicted from heart rate recovery curves. When no satisfactory recovery can take place between a series of successive operations the first pulse rate after work becomes progressively higher and the heart rate remains at a high level for a progressively longer time during the recovery period. The return toward the resting level is very slow and definitely points to the existence of "physiological fatigue" in these workers. Fig. 1 illustrates this situation.

The same method is used to analyze the physiological influence of the various parts of a given job consisting of several operations. Such an analysis indicates what part of a job is the hardest and what should be modified or eliminated in order to reduce the over-all stress. It becomes, therefore, possible to classify jobs according to their physiological stress.

It is clear that the work load is an important factor in determining the fatigue level. Heat is an added stress. Experiments in the laboratory as well as industrial surveys reveal the same phenomenon: the warmer the environment above 40° F, the harder the job. It is known that the human machine works best when it can maintain its temperature at about 98.6° F. Muscular work produces heat, and the more work the more heat which has to be dissipated to maintain normal body temperature.

When the surrounding temperature is below that of the body a certain amount of heat is lost by conduction, convection, and radiation and the remaining part is lost by evaporation of sweat and exhalation of water vapor. The body temperature remains constant when these various processes compensate for the heat produced by the normal metabolism and by muscular exertion. If the surrounding temperature becomes greater than that of the body, heat is gained by conduction, convection, and radiation, and the only means that remain to dissipate heat is through evaporative cooling. In order to do so the rate of sweating increases, and through vasodilation of the skin a greater amount of blood can reach the surface of the body and lose its heat. For the same amount of work the heart rate becomes progressively higher as the temperature increases, the load on the cardiovascular system becomes heavier, fatigue appears sooner, and exhaustion is reached faster. Fig. 2 shows the heart rate recovery curves obtained for the same job performed at various temperatures.

The amount of heat that can be lost due to the evaporation of perspiration depends on the air temperature, the humidity, and the air movement. When humidity increases, evaporative cooling decreases rapidly thus reducing the ability of the body to dissipate heat. Under these conditions high heart rates, high body temperatures and very slow recovery after work result in pronounced fatigue. Changes were observed in heart rate before, during and after a standard amount of work at various temperatures and humidity (Fig. 3). For the higher range of temperature and humidity the recovery from work was shown to be incomplete and to remain so for as long as 30 minutes after the end of work. Complete recovery is impossible when the surrounding atmosphere is too warm and too humid, and fatigue appears rapidly under such conditions.

A good example of the ill effects of high temperature and humidity is given when impervious clothing, worn as a matter of protection against chemicals, interferes with the dissipation of body heat. The layer of air trapped inside the suit warms up to body temperature and becomes saturated with moisture thus creating adverse environmental conditions. The elimination of cooling the body by evaporation produces a rapid and marked increase of the physiological stress and leads steadily towards a state of complete exhaustion with high heart rates and high body temperatures (Fig. 4).

Sex, age, the state of nutrition, and exposure to certain chemicals are also factors influencing the fatigue level and their action can be measured by changes in heart rate and in body temperature. As an example, Fig. 5 shows the influence of advancing age on men exposed to the same working conditions. There is no doubt that, for a

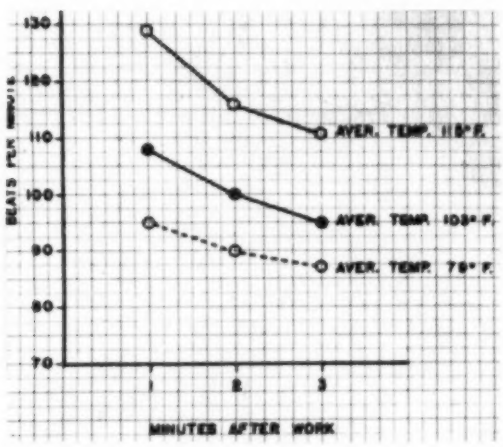

Fig. 2.
Influence of temperature on heart rate recovery curves.

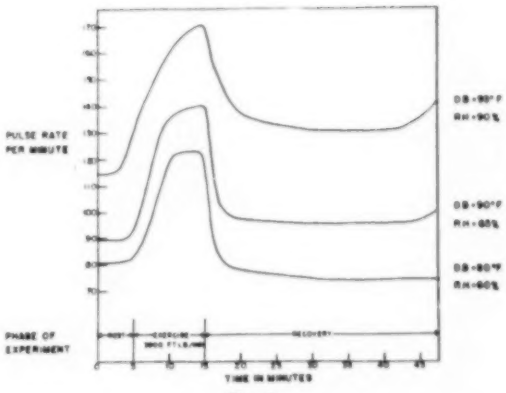

Fig. 3.
Heart rate before, during, and after a standard exercise for various environmental conditions.

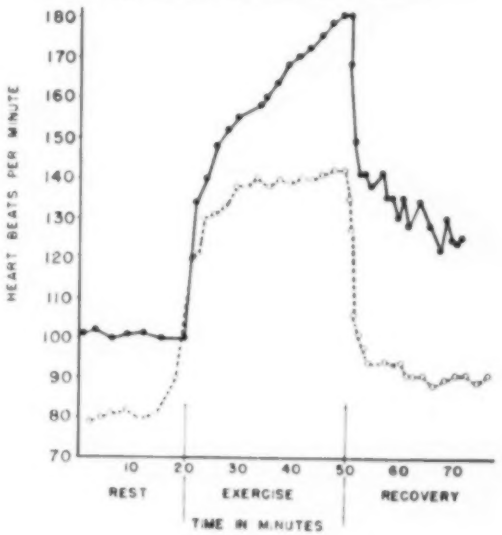

Fig. 4.
Effect of impervious clothing on heart rate.

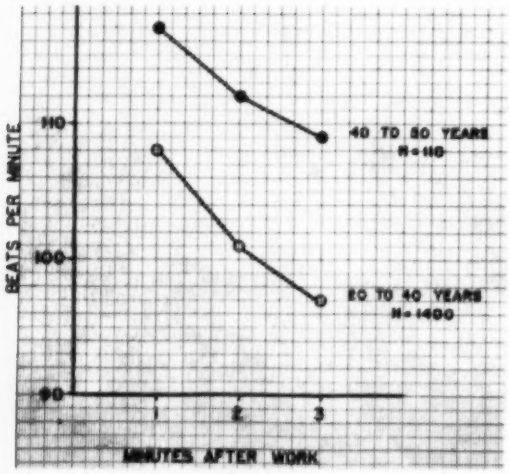

Fig. 5.
Influence of age on heart rate recovery curves.

standard work load, the stress is greater and fatigue appears sooner in the older workers. The same is even more true when heat is added as a factor of stress.

It can be concluded that by establishing the heart rate recovery curves and by measuring the changes in body temperature after work it is possible to determine the influence of many of the factors contributing to industrial fatigue.

However, other physical factors have not been investigated in plants because of the difficulty of realizing satisfactory experimental conditions. Dust, noise, vibration, smoke and fumes may be important contributors to fatigue but so far we have no experimental proof of this fact.

Reducing Fatigue under Physiological Control

IN ORDER to summarize simply what has been discussed, the following comparison can be made. Each worker owns a "physiological capital" which enables him to have a certain "physiological credit." As he works, he contracts a "physiological debt" which varies with the nature of the job. After the work is over, the greater the debt the longer it will take to pay it back and to recover fully to the physiological resting level. Therefore, any change in the job or in the environment that will reduce the physiological stress will also reduce the debt and the time necessary to recover. Consequently, for the same amount of work, fatigue will decrease.

The reduction in physiological stress can be evaluated by the lowering of heart rates and body temperatures and by the disappearance of high reactions towards the end of the day. The aim is to organize the work so that at the end of the shift the reactions should be the same or only slightly higher than they were at the beginning of the day's work.

Some examples of reducing the stress and of evaluating the physiological benefit of the change are now presented.

1. REDUCING THE WORK LOAD:

Any body motion is the consequence of the contraction of at least two groups of muscles: some which produce the action and the others which control it by antagonist contraction. The final results can be expressed as "mechanical work" in terms of foot pounds. It should be realized that, so far, no relation has been established between the mechanical work done and the energy spent by the body to maintain its balance and to accomplish the various motions necessary to produce the mechanical work. In terms of the human machine, what counts is not the mechanical work but the "physiological work" which is necessary to perform a certain movement and which sooner or later will produce fatigue. Nature, speed, and rhythm of motion influence the physiological cost according to the number of muscles involved and to the rate of contraction. In many instances additional muscles have to contract statically in order to maintain certain segments of the body in a set position so that a given movement can be accomplished. The static contraction of these muscles, which has no direct relation to the mechanical work, is nevertheless costly from the physiological point of view. A simple example of this fact is given by the much more severe fatigue experienced while painting a ceiling with numerous muscles statically contracted than while painting a floor when little static contraction is needed.

Many industrial operations can be made easier if the position of the body (static contraction), the nature of motion (dynamic contraction), and the speed of motion (rate of contraction) are so arranged that the work load is decreased and the physiological cost of the job is reduced to a minimum level. This can be achieved by combining time, motion, and physiological studies.

For any job in which the physiological expenditure is great enough to produce significant changes in heart rate, the heart rate recovery curves will determine the physiological cost of the job and will permit evaluation of any modification that is made in attempting to reduce stress and fatigue. For example, in a job where men had to skim impurities from the surface of a liquid with a long and heavy ladle, the tanks were situated at such a height above the floor that the operation had to be performed at shoulder level. Average reactions were high, reaching 160 beats per minute for the first pulse recorded one minute after skimming one tank. Special platforms were built so that the men could operate slightly above waist level. The average heart rate recorded one minute after the operation dropped to 112 beats per minute, indicating a drastic reduction in the "physiological work" necessary to do the job.

When the work load is not great enough to produce significant changes in heart rate, a method has been devised recently which analyzes, by means of piezo-electric quartz, the apparent changes of weight produced at the center of gravity of the subject by various motions in-

volved in a given job. Each time the changes of weight can be minimized the physiological cost of the motion is reduced as indicated by a lower consumption of oxygen. This method has given precise analysis of various movements, but its use in industrial practice is limited because of complicated and costly equipment.

In addition to improving motion and timing, an industrial operation involving hard manual labor can often be totally or partially mechanized, and consequently the physiological stress is reduced. By developing some mechanical device, a very fatiguing operation can be transformed into a comparatively easy one. Changes in heart rate recovery curves were observed in the same environmental temperature on men doing a job entirely by hand or partially mechanized (Fig. 6). In this case the mechanical device eliminated lifting and using a comparatively heavy hammer above shoulder level. Before this improvement a high physiological stress was put upon the workers as indicated by an average recovery pulse of 148 beats per minute measured one minute after the end of a work period. With the new method the average value fell to 110 beats per minute, demonstrating that the partial mechanization had resulted in a marked diminution of the stress.

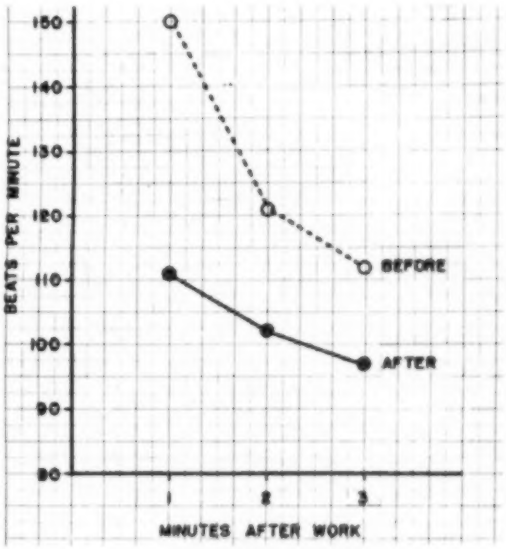

Fig. 6.
Average heart rate recovery curves before and after partial mechanization.

2. REDUCING THE HEAT LOAD:

Considering the effect of increasing environmental temperature on the physiological reactions, it is obvious that reducing the temperature at which the work is done will proportionately lower the reactions. This can be achieved by an adequate ventilation system, by properly insulating the sources of heat, by protecting the workers with screens or special clothing, and by developing tools and methods which will enable the man to work as far as possible from the source of heat.

When humidity enters the picture, adequate ventilation and sufficient air movement will considerably improve the situation. When temperature and humidity were reduced and air movement increased, more favorable heart rate recovery curves were recorded throughout a working shift (Fig. 7). At the same time the average body temperature was reduced from 99.3° F to 98.6° F. Therefore, maintaining temperature and humidity as low as ventilation cost permits, reduces considerably the physiological stress upon the cardiovascular system and the thermoregulating mechanisms of the workers. The final result is less fatigue and greater efficiency.

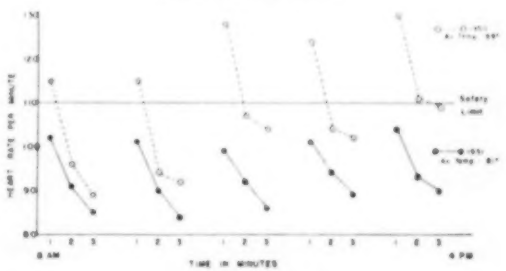

Fig. 7.
Effect of reducing temperature and humidity on heart rate recovery as work day progresses.

3. ORGANIZING ADEQUATE REST PERIODS:

In many instances, particularly in "hot industries," even when mechanization is advanced and temperature has been reasonably controlled, high reactions are still observed among the workers. In such cases adequately organized rest periods provide a reduction of the physiological stress. When the job is scheduled in such a way that the workers take, at set intervals, a rest period which is of long enough duration to insure a complete or nearly complete recovery, they will be able to avoid excessive fatigue and to remain in good physical condition throughout the shift.

Establishing adequate rest periods is not an easy task. It has to be done patiently, by the method of trial and error, and with the close collaboration of the physiologist and the industrial engineer so that changes in rate of work and in production can be evaluated together with changes in physiological reactions. The problem can be illustrated by results of studies made at two average temperature levels with the same group of workers (Fig. 8). At an average temperature of about 40° F, with short rest periods between successive operations in the morning and with longer rest periods during the afternoon, the workers were able to perform 11 full cycles of work without showing abnormally high reactions. When the groups were studied in an area where the average environmental temperature was around 82° F, the number of operations was reduced from 11 to eight, giving the men longer rest periods. Nevertheless, very high

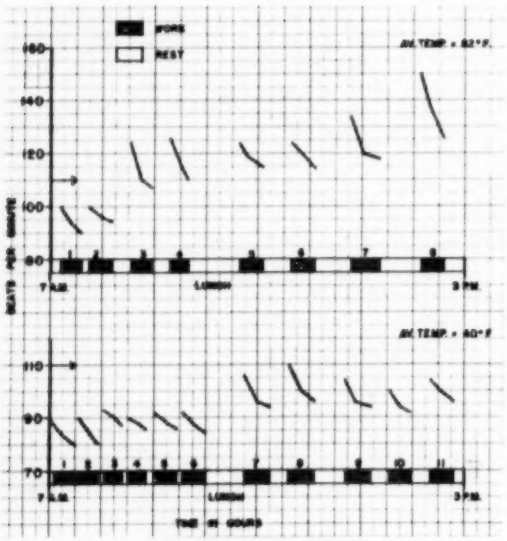

Fig. 8.
Heart rate recovery curves at various times.

physiological reactions were observed during the second part of the shift, indicating a progressive accumulation of fatigue. This shows clearly that at low temperatures the sequence "work-rest periods" were adequately determined to insure high efficiency with a low fatigue level.

At higher temperatures this system did not work. In spite of a considerable reduction in the total work load, and in spite of a considerable increase in the rest allowances, physiological reactions were at a high level. The stress became greater as the shift progressed and the men reached a state of extreme fatigue at the end of the day. In this case, in order to maintain both the physiological reactions and efficiency at an acceptable level, another solution had to be found which was to increase air movement in that particular area. Here again the combination of time study and physiological study led to a satisfactory organization of the day's work.

Duration of rest periods as the shift progresses and as the environmental temperature changes, as well as the time intervals between successive rest periods, must be accurately determined if a maximum of beneficial results is to be achieved. When an adequate solution is found the reduction of the physiological stress is evident as shown by the lowering of the heart rate and of the body temperature throughout the shift. In relation to this problem it must be remembered that complete recovery is impossible for men who rest in hot surroundings. In certain instances it has been found necessary to air-condition the rest rooms in order to insure environmental conditions favorable to a complete and fast recovery of the workers. Such rest rooms have been installed and used for several years in various plants of the Aluminum Company of Canada. The results have been very favorable, as illustrated by the comparison of the heart rate recovery curves obtained during the summer on two groups of men doing the same job in the same environmental conditions (Fig. 9). One group who took their rest periods in the plant or outside in the shade showed definitely higher reactions both at rest and after work than the men who could rest in air-conditioned rooms and could recover to approximately their normal resting level. The temperature maintained in these rest rooms varied with the plant temperature, but the humidity was kept at a constantly low level so that the clothing of the men, wet with sweat, dried quickly and made the workers more comfortable, insuring at the same time a good evaporative cooling and a complete return of body temperature to normal levels. Fig. 10 shows the average body temperature curves obtained under these two conditions.

4. ORGANIZING ADEQUATE TEAMS OF WORKERS: In certain operations where several men are involved, it is sometimes found that, in spite of

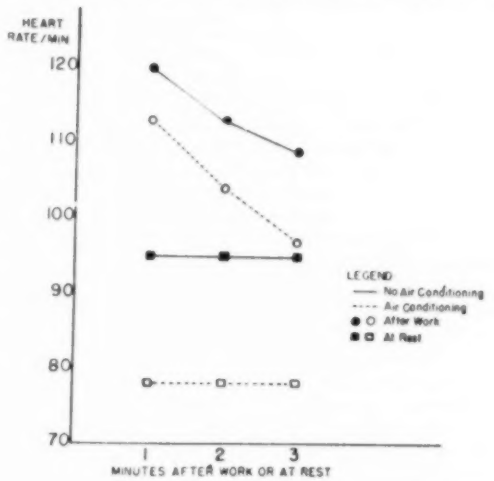

Fig. 9.
Average heart rate recovery curves after work and at rest with and without air-conditioned rest room.

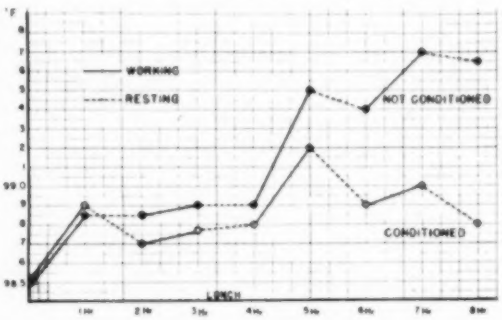

Fig. 10.
Average body temperature variations during an eight hour shift with and without air conditioned rest rooms.

various improvements, the physiological stress remains too high when the working team comprises the smallest number of men compatible with the job. Under these conditions the only way to bring down the reactions of the workers is to add men to the team. This decreases the individual physical exertion and increases the resting time. Fig. 11 gives the average heart rate recovery curves obtained when crews of three and four men were used on the same job. In addition to having a much higher pulse rate, the three-man crew also had a higher average body temperature of 99.6° F, as compared to 99.0° F, for the four-man crew. The addition of an extra man reduced the physiological stress on the cardiovascular system as well as on the thermoregulating mechanisms. Comparisons of reactions recorded on a comparatively cooler day with the environmental temperature averaging 98° F with those obtained on a warmer day averaging 115° F, demonstrated that the greater the physiological stress produced by the job and the environment, the greater the improvement achieved by the addition of an extra worker.

5. INFLUENCE OF ADEQUATE WATER AND SALT: The importance of an adequate water supply for workers involved in manual labor in hot surroundings has been emphasized repeatedly. In heavy jobs 12 quarts of water or more can be lost through sweating during eight hours of work. In order to avoid excessive fatigue this loss of water must be compensated for as the shift progresses. Drinking must be frequent and sufficient in order to maintain the water metabolism at a normal level on an hourly basis. If the water intake is insufficient, efficiency is reduced and exhaustion soon appears. In practice, drinking will be adequate if an abundant supply of cool, clean and palatable water is available. Frequency distribution curves of body temperatures were recorded for the same job in the same environmental conditions with and without a good water supply (Fig. 12). When the supply was inadequate, the water temperature was around 70° F, and the drinking was insufficient to replace the water loss as proved by marked weight reduction in the workers at the end of the shift. High heart rates and body temperatures of 100° F and above were frequent. With an adequate supply of water maintained at a temperature of 42° F to 45° F the drinking became more abundant, water metabolism was more efficiently maintained, and body temperatures of 100° F and more disappeared. At the same time the heart rate recovery curves stabilized at a definitely lower level, indicating that the total physiological stress had been appreciably reduced.

Keeping a balance between fluid intake and fluid loss is a matter of training because most people who are sweating profusely will drink about two-thirds of what they eliminate on an hourly basis. If the water balance is to be maintained throughout an eight-hour shift one has to drink more than necessary to merely quench his

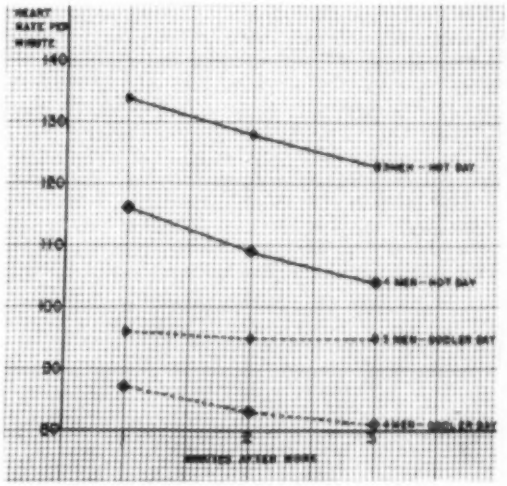

Fig. 11.
Influence of team organization—average heart rate recovery curves for a three-man and a four-man crews on a hot day and on a cooler day.

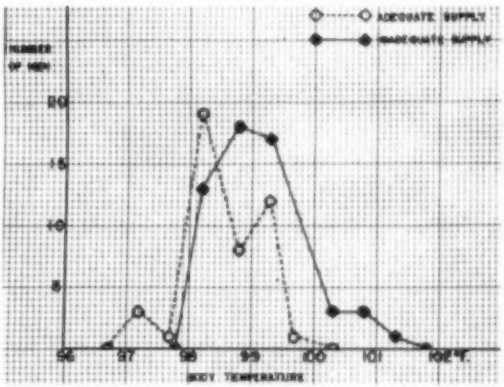

Fig. 12.
Influence of adequate water supply—distribution curves of body temperatures with and without adequate cold water supply.

thirst. We have had good results by giving the workers paper cups and explaining to them that in order to replace the amount of sweat lost they should drink an average of so many cups at the end of each work period. The number of cups was experimentally determined by studying the average wieght loss of the workers involved in various jobs. The men learned rapidly how to force their water intake to compensate more accurately for their sweat loss, and a definite improvement in physiological reactions was seen.

In these experiments salt tablets were not used and the salt loss was compensated for by adding enough salt to the food at every meal. It has been shown that the concentration of sodium chloride eliminated in the sweat increases as work is prolonged and as the rate of sweating becomes greater. When a progressive depletion of salt occurs

fatigue soon appears and, in extreme cases, total exhaustion and heat cramps are observed. Nevertheless, laboratory experiments have shown that the sodium chloride level in blood serum remains remarkably constant in prolonged work in heat provided the over-all daily intake of salt with the meals is adequate. Our experience with industrial workers eating a good diet confirms these findings. The men were instructed to salt their food abundantly and no extra source of salt in the form of salt tablets or salted drinks was provided. This practice eliminated completely the gastrointestinal uneasiness, the stomach cramps and the vomiting which were frequently observed when salt tablets were used. Under the usual circumstances of exposure to industrial labor and heat, it is advantageous to replace the sweat loss on an hourly basis and to replace the sodium chloride simply by salting adequately the daily meals. As proved in many instances, the final result of adequate water and salt intake is to maintain the efficiency and the well-being of the workers in spite of very abundant sweating.

6. SELECTION OF WORKERS:

The capacity to perform muscular work depends on the natural physical fitness of an individual and on his degree of training for the specific activity in which he is involved. Even when studying men who appear to be thoroughly adapted to their work and to the environmental conditions in which the job is done, wide differences are found among individuals.

The frequency distribution curves of pulse rate and body temperature demonstrate that in order to accomplish the same task some workers experience a much greater physiological stress than others. The upper values of the distribution curves indicate that these men are comparatively "paying too much" for the job and they should be given an easier kind of work. When the "physically unfit" for a given job are eliminated, the remaining group will have a higher efficiency at a lower physiological cost. In many instances the elimination of the poorly fit will have a beneficial effect on the morale of the group, because one must remember that a man who is fatigued by his job blames the job rather than himself and influences the attitude of his co-workers. From all points of view it is important to transfer these workers and to use, for comparatively hard jobs, men who can handle them easily.

So far it is only by studying the physiological reactions produced by the job that the qualifications of an individual can be determined. For example, selection of heat resistant workers and a system of gradual adaptation has been used successfully at the City Deep Mine in South Africa. In an experimental chamber equipped with rocks and shovels the new workers are given probationary tests in atmospheres comparable to those encountered in underground work. "Heat intolerant" individuals are detected by excessive increase in pulse rate and body temperature and are given no employment in hot jobs. "Heat tolerant" subjects are gradually adapted to their future task in periods of four to 14 days according to individual tolerance.

Such methods take time and have to be handled with great care in order to avoid antagonizing the workers. Nevertheless, considering the cost of frequent turnover and of continually training new men, and considering the ill effects of chronic fatigue and dissatisfaction among the workers, the experience is well worth trying in industries where physical exertion and exposure to heat are combined to give a predominant importance to the physiological capacities of the workers.

From the general point of view of labor utilization the lower the physiological stress required by a given task the more people will have the capacities to qualify for it. Therefore, the recruitment of new personnel will be simplified and the employees will be able to continue working at a satisfactory level of efficiency in spite of advancing age. It is obvious that it is in the interest of both management and the workers to see that, by the combined efforts of the industrial engineer and the physiologist, the stress and fatigue produced by the day's work be reduced to a reasonable level.

It has been our experience over the last eight years that when the average value of the first recovery pulse is maintained at about 110 beats per minute or below no abnormal fatigue is observed as the day progresses. It appears that this level of work can be maintained throughout the shift in a "physiological steady state" provided work and rest periods are adequately organized. The recovery is complete and the physiological measurements taken at rest at the end of the day are within normal limits.

Conclusions

THE unmeasurable factors which cause stress and fatigue in industry, such as emotional stimuli, boredom, social adjustment, etc., are certainly more numerous than those which can be measured. In spite of our ignorance of the quantitative importance of these imponderables, certain physical factors which lead to fatigue have been measured and their importance evaluated. As a result we know that industrial fatigue can be reduced. *First*, the environmental conditions can be improved to the best possible level. *Second*, machines and tools can be designed for maximum efficiency with minimum physiological stress. *Third*, the workers can be chosen on the basis of their physiological fitness for the given job and their work can be organized to produce minimal fatigue. The accomplishment of these objectives requires the collaboration of the physiologist, the engineer, management, and labor.

Such a cooperative endeavor has been carried on for the last eight years by the Aluminum Company of Canada. It has resulted in improving the working conditions in numerous jobs, thus reducing fatigue and creating higher efficiency and morale in the plants.

Hydrocortisone Therapy in Ganglia

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THE diagnosis of a ganglion, the cystic tumor that frequently occurs adjacent to joints and tendons, rarely comprises a serious problem. The ganglion is found among children and adults, among men and women, among working people regardless of occupation. Frequently it "pops up" without revealing any definite relationship to trauma, disease, or occupation. Very little is known about the etiological factors which contribute to the development of a ganglion. Medicine in general has not shown too much interest in this subject. Pathological studies have recorded divergent opinions about the origin of ganglia, often based on occasional incidental findings and hypotheses. Some practicing physicians regard the protruding cyst as trivial, and are satisfied with various palliative procedures of therapy or occasional surgical management. Industrial medicine, in its attempt to prevent trauma through selective placement, as well as to provide proper care to the injured employee, must interest itself in such relatively minor conditions as ganglia. Even if treatment is administered in the most skillful manner, occasionally an unsightly scar or functional loss may follow surgery. With the existing trend of broadening the interpretations of compensability of industrial injuries and occupational diseases, such ailments become of increasing importance in industry.

The large population of Western Electric Company's Hawthorne Plant has given us ample opportunity to study the problems of ganglia in industry. Here we make general observations in regard to etiology and pathology, and present our specific experience regarding treatment.

Reviewing the available literature, we find that, among the authors responsible for the many different concepts about the origin of pathology of the ganglion, Hippocrates was the one who first advanced the opinion that ganglionic tumors contain "mucoid flesh." His theory was challenged in 1746 by Eller, who related the ganglion to a ruptured tendon sheath. In 1847, Henle called it a mucinous tumor; Gosselin, in 1852, considered it a retention cyst; Hoeftman, in 1876, referred to the ganglion as a synovial dermoid, and Vogt, in 1881, as a bursa. In 1882, Volkmann described ganglia as herniations of synovial membrane. The idea of Ledderhose, published in 1893, that ganglia are due to cystic degeneration of connective tissue around a joint or tendon sheath, was supported by Ritschl (1895), Thorn (1896), Thomson (1898), Payr (1898), Hoffmann (1899), Borchardt (1900), Franz (1903), and Clarke (1908). In 1915, Floderus defined ganglia as tumors of the joints, and suggested the term "arthroma." Buxton (1923) disagreed with this theory. He found them to be tumors arising from the tendon sheath, not from arthrogenous tissue. In their review in 1925, Kuttner and Hertel concluded that ganglia are neoplasms arising from remaining embryonic tissue of the synovial membrane. Three years later, in 1928, Carp and Stout concluded, after careful pathological studies, that ganglia are the result of a mucinous degeneration of connective tissue in close proximity to a tendon or a capsule of the joint. King, in 1932, emphasizing the non-neoplastic nature of the ganglion, did not believe that this condition is the result of a degeneration of connective tissue. He attributed the ganglion to a proliferating process of spheroidal cells as they are found in subacute inflammation of the synovial membrane of joints or tendon sheaths. In 1937, DeOrsay, Mecray, and Ferguson challenged King's theory, and expressed the view that the development of a ganglion is due to a degeneration of collagen fibres. They found the contents of the resulting cysts to be myxoid rather than mucinous, and therefore not due to secretion but to degeneration.

All these efforts to determine the origin of the pathology of ganglia were more or less dictated by the inefficiency of the treatment of ganglia, the desire to find a causal therapy instead of the known symptomatic therapeutic methods. Rupture, subcutaneous incision, aspiration, injection of sclerosing and irritating agents, baking with massage, pressure bandage, and excision are the commonly recommended measures for treating ganglia. Some authors, like Neumuller and Orator, believe that radical excision constitutes proper treatment; others, like Carp and Stout, favor non-operative therapy.

From 1948 until 1953 we have treated 131 cases of ganglia of wrist joints, knee joints, and tendon sheaths in our Hawthorne Plant. Our therapeutic measures have consisted of heat applications (infra-red, inductotherm, microtherm), pressure bandages, surgical removal, and hydrocortisone injections. Because of our previous disappointing results of rupture of ganglia or aspiration with or without sclerosing chemicals, we have not used these methods during the last five years.

The results of the different types of treatment we have administered in our ganglia cases are as follows:

A. NON-OPERATIVE TREATMENT: Heat applications, pressure bandages.

TABLE I.

Location of Ganglion	Number of Cases	Disappeared	Reappeared	Unchanged
Wrist	32	9	6	17
Knee	4	2	—	2
Tendon	11	6	—	5
Total	47	17=36%	6=13%	24=51%

It is a well-known fact that some ganglia spontaneously disappear without any treatment at all. Figures to indicate the frequency of such spontaneous disappearance are not available. If we could make allowance for such cases, then the number of ganglia which have disappeared, according to our statistics, as a result of conservative treatment would probably be markedly reduced.

B. SURGICAL TREATMENT.

Conservative treatment was followed by surgery when the ganglion remained unchanged after several months, when pain or weakness persisted, or when the patient expressed his desire to have the tumor removed. Operation was performed under local anesthesia. After separating the cyst from the adjacent tissues, the wall of the ganglion was excised as completely as possible without tying off the so-called "pedicle." In 54 cases the operative method was chosen for removal of the ganglion. Results are listed in Table II.

TABLE II.

Location of Ganglion	Number of Cases	Disappeared	Reappeared
Wrist	47	31	16
Tendon	7	7	—
Total	54	38=70%	16=30%

C. HYDROCORTONE® TREATMENT.

Hydrocortone has been used successfully in the treatment of acute and chronic inflammatory conditions. Many favorable results following the introduction of Hydrocortone into the synovial cavity have been reported by Hollander, Brown, Jessar, and Brown. Injections of Hydrocortone have been given by Stein, Stein, and Beller for the condition known as "tennis elbow." Our own experience in treating epicondylitis, DeQuervain's disease, and similar conditions with Hydrocortone has confirmed the reports of significant decrease of pain and swelling as well as the lack of adverse effects from administering such treatment.

Reviewing the studies of pathological changes taking place in the development of ganglia, it appeared to us that it is correct to assume that non-specific pathogens are responsible for the reaction of the tissues involved in this particular process. Either predisposition or trauma or a combination of both may initiate a local inflammation that is followed by a breakdown of cells and a formation of a cyst wall. In mentioning trauma as a causative factor, we subscribe to the theory of Selye, as expressed in his experimental studies, that excessive muscular exercise may stimulate the tissue in close proximity to joints and tendon sheaths, and the response to these stimuli may cause inflammatory irritation, degeneration, and cyst formation. Thus, if the ganglion is the product of non-specific inflammatory and degenerative changes of the normally existing tissue, such changes should be reversible. The antiphlogistic effect in the use of hormones like Cortisone and Hydrocortone to suppress inflammation prompted us to speculate that they could be an adjuvant in the treatment of ganglia. Following this tentative conclusion, we began to treat ganglia with Hydrocortone injections.

In all of these cases we have injected 0.3 to 0.5 cc. (depending upon the size of the ganglion) of saline suspension of Hydrocortone acetate, 25 mg. per cc., into the cavity of the cyst without any attempt to aspirate fluid from the ganglion. Such small amount of fluid could be injected into the cyst without any difficulty. The needle was inserted quickly into the skin without local anesthesia. Slight soreness after the injection, lasting for a few hours, was reported by some of the patients. No other treatment was administered, and patients continued to do their regular work. A marked diminution of the tumor could be observed as early as 36 hours after the injection. We have treated 30 ganglia with Hydrocortone injections. Among them were 21 ganglia of dorsal or volar aspect of the wrist joint, one ganglion of the knee joint, and eight ganglia of the flexor or extensor tendons of either hand. Fourteen patients obtained one injection of Hydrocortone, in 10 cases two injections were necessary to make the ganglia disappear, the rest were given three injections at weekly intervals.

Table III shows the result of Hydrocortone treatment in these 30 cases:

TABLE III.

Location	Number of Cases	Improved	Disappeared	Reappeared	Unchanged
Wrist	21		21	0	0
Popliteal region	1		1	0	0
Tendon	8	4	4	0	0
Total	30	4=13%	26=87%	0	0

While the ganglia of the wrist joint have responded exceedingly favorably, the ganglia of the tendon sheaths were more obstinate to our injection therapy. The technical difficulties which one encounters by injecting into the cavity of a ganglion of the tendon sheath, a tumor of the size of a pea or smaller, may account for the fact that only four of the ganglia of the tendons

Hydrocortone is the registered trade-mark of Merck & Co., Inc., for its brand of hydrocortisone.

disappeared and four of them were improved. The latter were reduced in size, and the soreness which was present prior to the injection disappeared completely.

All of our ganglia cases were treated ambulatory. Those under conservative treatment were placed on work restrictions which allowed them a "limited use of the hand." The patients who had undergone surgery for their ganglia were declared temporarily unfit for any kind of work. Patients who were injected with Hydrocortone were permitted to return to their regular work immediately after the injection.

The following is a comparison of the results of the different types of treatment in regard to the employee's ability to work:

TABLE IV.

Treatment	Average Time of Treatment	Average Time of Total Disability	Average Time of Partial Disability	No. of Cases Resulting in Permanent Partial Disability
Conservative and Surgical	55 Days	14 Days	52 Days	1
Hydrocortone Injection	10 Days	0	3	0

Comparing all the data recorded in this paper, it is quite evident that Hydrocortone injections brought by far better results than any other therapeutic method we have used in the treatment of ganglia. No time has been lost, no restrictions were required, hardly any discomfort was experienced by the 29 employees whose ganglia of wrist joints, knee joint and tendon sheath were removed with almost painless injections. The results of this treatment have prompted us to recommend it for further study and observation.

Summary

A STUDY of treatment of 131 ganglia has been presented. A comparison of conservative and surgical treatment of ganglia of joints and tendon sheaths with a new method of injecting ganglia with Hydrocortone has been made. Our findings reveal that steroid therapy has produced excellent results. The simplicity of administering Hydrocortone therapy without any detrimental or unpleasant effect upon the patient, the absence of unfavorable after-effect, and the disappearance of the ganglion without permanent or temporary impairment and without any loss of valuable time are indications that topical injection of Hydrocortone is a most desirable treatment of ganglia.

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With and Without

INDUSTRIAL HEALTH REVIEW (bulletin of the Industrial Hygiene Section, St. Louis Health Division, September, 1953), on the subject of industrial nursing and medical guidance, says: "Industrial health services have boomed since the onset of World War II. Their worth was demonstrated during the protracted war years and continued to expand after conversion to peace-time production. Most of these occupational health services have been thoughtfully and carefully planned and implemented. However, the lure of lowered insurance rates induced numerous small plants to initiate health services for their employees. They equipped a first aid room, employed a nurse, and felt they had fulfilled their obligation as to the Medical Department. Depending on the calibre of the nurse, the department flourished or floundered. Some had adequate medical direction, and some had only the medical panel approved and paid by the insurance carrier to whom workers with occupational conditions were sent. By its very definition, *nursing is a function to be performed under the direction of a physician, duly licensed and practicing.*" A summary of the situation in 93 St. Louis plants: in 48 plants, 121 registered nurses served 70,215 employees "with adequate medical direction"; in 45 plants, 52 registered nurses served 46,626 employees "without medical direction."

Disability, Rehabilitation and the Law of Damages

IMPLICATIONS OF MODERN REHABILITATION MEDICINE

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THE physician is recognized universally as the best judge of the manner in which the residual abnormalities of injury or disease affect function. His knowledge and experience have always been relied upon, and accepted by the courts, in the adjudication of claims for compensation. Unfortunately, this knowledge and experience are usually expressed in the intangible terms known to the medical profession as *clinical judgment.*

Although every physician appreciates the importance of demonstrable evidence, medicine has been slow to adopt objective measurements in its appraisal of the significance to the organism as a whole of abnormalities in the functional capacity of the component parts. To do so greatly would expedite the equitable settlement of compensation claims.

Approached from the physiologic point of view, disability evaluation carries a special connotation. Instead of being concerned with a description of the anatomic injuries sustained, from which abnormalities in function may be deduced, it places emphasis on the *direct measurement of the behavioral capacities of the living machine.* Furthermore, the living machine is examined as a total organism, richly endowed with mechanisms which compensate autonomously for deviations in structure. This greatly complicates disability evaluation. But disability evaluation is not simple. Indeed, it would be a mistake to approach disability evaluation with the attitude of mind of a mechanic called upon to assess the damage to a car which has survived the trauma of a traffic accident. Unlike the automobile the human machine has the capacity to compensate for abnormalities in function. This it does to an amazing degree. If autonomous compensation does not suffice, the limits of adjustment may be extended significantly through the application of modern rehabilitation techniques. These are the techniques that have given *new hope to the handicapped,"* to use a catch phrase which has been exploited dramatically by Rusk and Taylor,[1] of the Bellevue-New York University Institute for Physical Medicine and Rehabilitation.

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Disability evaluation also may be approached from a sociological and economic viewpoint. In order to have practical meaning in this sense, disability evaluation must be related specifically to the physical demands that have to be met by the particular patient. Whenever we talk about the physical fitness of man, we must always ask ourselves one question: *physical fitness—for what?* The neuromuscular machinery of a professional athlete is something unique and radically different from that which answers all the needs of the sedentary man engaged in desk work. Thus an identical anatomical injury may have vastly different effects on the human beings concerned, because human beings utilize their physical and mental endowments in different ways.

Disability evaluation must be individualized for another and more subtle reason. All biological structures demonstrate great variability in the manner in which they react to apparently identical stress. It so happens that the living machine operates under wide margins of safety. As already indicated seemingly irreparable damage is known sometimes to stimulate compensatory adjustments which result in astonishing degrees of fitness. This is epecially true if the handicapped individual is given the opportunity to operate in areas of activity which by-pass his specific disabilities. Thus the keystone upon which rehabilitation rests resolves itself into the dynamic assessment of the fitness of the whole man, and the matching of residual abilities to the demands of fields of endeavor for which the individual concerned possesses the requisite aptitudes, strength, endurance, training, and skill.

It took the exigencies of the manpower shortages of World War II to teach American industry an important lesson. As is well known, the jobs and occupations pursued by man require an infinite variety of abilities, aptitudes, and specific skills. What was never appreciated fully previous to the war is that no occupation pursued by man demands superiority in all qualities of performance. Indeed, experience has demonstrated beyond a doubt, that physical disability need not be a job handicap.[2] This holds true, of course, only when the physical, mental, and emotional capacities of the less-than-perfect worker are

matched accurately to the demands of the job he is expected to perform. Thus selective placement has become a gateway to the attainment of economic independence by the handicapped. The simplicity and reasonableness of this concept render it so attractive that the difficulties inherent in the implementation of such a plan are apt to escape appropriate consideration.

The technique that has been developed to serve the needs of selective placement is called physical demands and capacities analysis.[3] Any occupation may be broken into its component parts. This is done by a job analyst, who then records on a check-list the physical demands for the successful performance of each step in the total procedure. For example, to be successful in a given occupation a man must be able to stoop and lift a load of a designated maximal weight, to stand, walk, reach, and climb. The physician examines the job applicant, and fills out a similar checklist on which he records the physical capacities of the man. This is usually done without reference to any particular job. The personnel officer is given the task of matching the job and the man, or, to put it another way, of matching the demands of an infinite variety of jobs with the capacities of a particular applicant employable in a restricted sense.

To date, job analysis has been concerned overwhelmingly with what a man does.[4] Time and motion studies[5] have added a wealth of information on how specific objectives may be accomplished most rapidly. By and large no one has considered the *physiological demands* of the constellation of elements which characterize a job, or the magnitude of the variations in these demands which are the natural concomitants of changes in environmental and psychological stress. If an attempt is made to evaluate the biological consequences of a disability in a specific job situation, the tests applied are usually only grossly qualitative. However, many of the basic elements of physical demands and capacities analysis lend themselves to direct measurement. For example, strength, power, endurance, coordination, reaction time, speed, agility, accuracy, and balance are all measurable variables related to job fitness. *A priori* reasoning suggests that the component parts of any physical act may be assembled into a miniature occupational situation and subjected to quantitative physiological study. This is essentially the procedure followed some years ago by Storms, when he was affiliated with the Toronto Workmen's Compensation Board Rehabilitation Clinic. Storms knew the physical demands of the work done by the typical patient referred to the Clinic. Armed with this information, he assembled the equipment or constructed the devices necessary to permit the injured man to re-train himself in the specific skills demanded for the successful performance of a specific job or job segment. If the patient was unable to meet standard job requirements, recourse was available to either of two procedures; to re-engineer the job to fit the particular workman's disability, or retrain the man in a different job with demands not exceeding residual capacities. Needless to say few physicians have the unique combination of training and experience to practice rehabilitation of this type. The trend in this country is to rely upon the judgment of non-medical testing experts and vocational training counselors.

To recapitulate, successful rehabilitation terminating in correct job placement involves appreciation of these fundamental concepts:[6]

1. Nearly all disabled persons have more ability than disability.
2. Few jobs require all of a worker's ability.
3. Proper placement involves matching a worker to a job on the basis of his ability to meet the demands of that job.
4. When selective placement is practiced, disability disappears as a job factor.

A WEALTH of rapidly accumulating rehabilitation experience suggests that it is possible to employ satisfactorily the great majority of workers classifiable as handicapped. A relatively small percentage are employable only under sheltered conditions, either temporarily or permanently. Others are destined to remain homebound. The level of rehabilitation attained is dependent only in part upon access to special treatment facilities. Psychogenic factors have a profound effect on how well the living machine operates in any situation. In the absence of the will to work, an essentially normal man may be less effective than the handicapped individual who has disciplined his body and spirit to withstand the stresses imposed by injury or disease.

The successful matching of men and jobs requires that the worker shall have the ability to accomplish the task assigned efficiently; that he shall not be a danger to himself or cause an accident that might injure others, and that the job shall not aggravate the disability present at the onset of employment. If these basic requirements are met the health of the disabled worker will be maintained, his safety and that of his fellow workers will be guarded, and his job efficiency will equal or excel that of the average able-bodied person.

From what has been said thus far, it must be obvious that the rehabilitation expert has no interest in disability evaluation *per se*. His concern is with the factors on the opposite side of the ledger, that is, with the assessment of residual abilities. More important than that, with the development of what is left, to the peak levels of capacity attainable through hard work and systematic training. The final task, of course, is the harnessing of residual capacities to practical skills. The record of residual ability contains the factual information upon which the patient must rebuild his life as a member of a social or family group to whom he bears varying degrees of responsibility. When the clinical judgment and wise counsel of the experienced physician can be added to *objective measures* of residual ability, we have the best possible combination of infor-

mation in terms of which the patient may be guided toward the acceptance of realistic vocational objectives which are compatible with fact. If a man's injuries are such that his industrial productiveness has been significantly downgraded in spite of total rehabilitation, the deficit in ability might well entitle him to a commensurate degree of compensation. It seems abundantly clear that the first obligation of society is to see to it that the injured man has an opportunity to be rehabilitated. If good rehabilitation facilities were more generally available, and if rehabilitation techniques were promptly and thoroughly applied, the number of injuries classifiable as seriously disabling would be radically reduced. Society's behavior is paradoxical indeed when it pays a man in dollars for disabilities which might be prevented or significantly alleviated through modern techniques of treatment.

IT HAS BEEN the contention of the laboratory and the clinic with which I have been affiliated that several important things can be done if we take the trouble to perform a physiological type of disability evaluation instead of contenting ourselves with the enunciation of clinical judgments unsupported by demonstrable evidence. Objective disability evaluation establishes the initial status of the patient at the time he presents himself for rehabilitation. Having examined the patient and assessed his disability, the next step in procedure is to map out a rehabilitation program. The gradient of the patient's restorative progress can then be measured by a periodic reapplication of the same objective tests that were applied initially. Many physical capacity tests are in themselves rehabilitation devices. Extension in the extent, skill, speed, or duration of the effort put forth in the performance of prescribed exercise may be quantitatively evaluated and, when graphed against time, utilized to provide a curve of progress. When such curves are compared with established norms, or with concomitant observations made on the uninvolved contralateral side of the body, the end-point of effective rehabilitation may be detected as a plateauing of the training curve. To terminate treatment when optimal improvement has been reached is, of course, of great economic importance to the individual, industrial concern, or the agency paying the costs of treatment. The end-point of effective treatment also indicates the degree of residual disability not amenable to reduction by the further application of the therapeutic methods employed. Such end-result appraisal of abilities and limitations, provides the best possible starting point for vocational training or job re-engineering when the disability remaining is such as to demand significant modification in work patterns.

Whenever rehabilitation or testing procedures are applied the end-results attained are dependent on a combination of many complex and interrelated physiological and psychological factors. The two most important appear to be the technique of their application and the desire of the patient to rehabilitate himself. Unless the physician responsible for the patient understands both the physiological consequences of disability and their mechanisms, neither intelligent testing nor effective re-training are possible. The full appreciation of these always includes a thorough consideration of psychosomatic relationships. The time has probably come for a considerably more physiological and a less mechanistic or anatomical approach to disability of the neuromuscular and skeletal systems.

Summary

A BRIEF review of problems involved in the resolution of the conflict between disability and rehabilitation suggests first that it is futile to evaluate invalidity without relating the magnitude of the dysfunction measured to the specific stresses to be met. A hypothetical ideal of performance may exceed or fall short of the normal needs of the particular patient. Second, the evidence points clearly to the fact that it is the duty of every individual concerned with the assessing of the consequences of injury to place emphasis on the preservation of function and the development of compensatory skills, rather than on the magnification of disability for the sake of monetary reward. The latter course may produce irreparable degrees of chronic invalidism. It follows, therefore, that no single step in the action to be taken is probably more important than insistence upon a trial of good treatment in a reputable rehabilitation center before deciding on the magnitude of the residual disability for which the patient is to receive compensation. The benefit inherent in total rehabilitation may far exceed the most generous monetary compensation.

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Cadmium Intoxication

Clinical Report of an Acute Accidental Group Exposure

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SIGNIFICANT industrial exposures to cadmium with intoxication via the respiratory tract are sufficiently infrequent to justify a report of a group of four so exposed, and in whom recovery has been complete.

Circumstances of Exposure

THE operation responsible for the exposure is a metallizing procedure by means of which cadmium wire[1] is melted in an oxyacetylene flame and then deposited by being blown against a rotating spindle. Because of the small diameter of the spindle, the efficiency of deposition was probably no more than 40%, so that significant amounts of liquid cadmium were dispersed into the workroom air as a contaminant. This likelihood was further increased by the absence of any local exhaust ventilation. Because of the low melting point of cadmium metal (320.9 C), and because the cadmium had to be deposited as metallic cadmium, it was felt that the environmental contaminant at this point was metallic cadmium and not cadmium oxide fume.

The operation was conducted in a small rectangular room approximately 15 ft. x 20 ft. x 10 ft. The operator, M.S., stood with his back to an open doorway leading to the outdoors, and faced the lathe and rotating spindle. In this position the natural room ventilation tended to carry the entrained particulate cadmium away from him and toward the room exit 15 feet away. Two men, E.S., a maintenance welder and his helper, C.L., were engaged in a repair (mild steel) welding operation in the doorway. The fourth exposed individual was a female clerical worker employed on the second floor of the building. It would seem unusual that exposure should occur until it was demonstrated that her desk and chair were located directly beside an open ventilating duct which communicated below over the immediate vicinity of the welding.

M.S. began his metallizing operation about 11:00 A.M., October 24, 1951, and about 2:30 P.M. of the same day the operation was completed. In all, about 10 pounds of cadmium wire had been used. Although it was felt that the exposure of M.S. was chiefly to elemental cadmium, the resultant disabilities of the welder, his helper, and the female clerical worker might well be due to cadmium oxide fume generated from the entrained elemental cadmium as it entered the considerably higher temperature of the welding arc. It was impossible to measure the concentration of cadmium in air about the metallizing and welding operations at this time. It was, however, possible to make such measurements for a comparable operation, suitably exhausted, at a later date. This information is contained further on in the body of this report.

No attempt was made to measure particle size of the entrained material, but it was felt that it would be relatively large at the site of initial production. Particle size of the cadmium oxide fume was felt to be infinitely smaller and to approximate that noted for silica, iron, or lead when subjected to high temperatures equivalent to those in the welding arc. This difference in the physical state of the cadmium accounts for the much enhanced effect upon E.S. as compared to the clinical effects exhibited by the other exposed personnel.

Clinical Report

THE laboratory findings covering the blood studies, urinalyses, ventilatory measurements, and levels of cadmium excretion have been summarized for the group in Chart I.

M.S. (metallizing operator), age 41 years, white male, spent at least two and a half hours at the operation as described. Complaint did not begin until at least one and a half hours after the job had been completed. Coughing, nonproductive in nature, associated with chest pain, anorexia, and abdominal discomfort developed in rapid succession. These were unremittingly present from the day of exposure until about 36 hours later when they slowly began to subside. By November 9, 1951, all complaint had ceased. Physical examination upon the morning following the exposure indicated some apparent dyspnea but without cyanosis. There was no elevation of temperature. Marked injection of the nasopharynx was noted. The oral and gingival mucous membranes were normal. Auscultation of the chest revealed no abnormalities. A chest film taken the same day revealed some bilateral expansion of the root areas with a general increase in normal bronchovascular markings throughout both lung fields. These findings were felt to be compatible with a diagnosis of pneumonitis of chemical origin. Fortunately here, as in the other exposed personnel other than E.S., we had available for comparative study fairly recent preplacement or periodic health survey chest films

CHART I.

Date	Blood Studies HBG.*	RBC x10⁶	WBC x10³	Differential % F	B	L	M	E	B	Cellular Abnormalities
M.S.										
10-25-51	12.4	5.2	21.6	68	9	20	2	1		nothing remarkable
10-31-51	13.0	4.4	7.7	60	2	30	6	2		nothing remarkable
11- 3-51	12.8	4.2	7.7	65		30	3	1	1	nothing remarkable
11-17-51	12.4	4.4	8.1	62	2	32	3	1		nothing remarkable
12- 8-51	14.0	4.8	9.7	50	5	39	3	3		nothing remarkable
C.L.										
10-26-51	10.6	3.8	9.9	70	1	15	10	4		moderate hypochromia
11- 3-51	11.4	4.0	6.5	61	2	30	6	1		moderate hypochromia
11-10-51	12.8	3.9	8.5	47	5	42	4		1	moderate hypochromia
M.S. (clerical)										
10-25-51	12.1	5.07	11.6	68	10	17	4	1		marked WBC granulation
10-27-51	12.6	4.2	7.8	52	8	30	6	3	1	nothing remarkable
11-10-51	12.1	5.0	10.4	51	2	41	4	2		nothing remarkable
E.S.										
10-25-51	14.9	6.1	22.9	77	4	15	3	2		nothing remarkable
10-30-51	15.3	4.9	9.4	54	5	29	4	1	7	nothing remarkable
11-17-51	17.2	5.2	9.1	53	2	38	5	1	1	nothing remarkable
12-10-51	14.9	5.4	11.5	69	3	23	2	3		nothing remarkable

BLOOD CHEMISTRY	Serum Sodium	Serum Potassium	Non-Protein Nitrogen
M.S. (clerical)			
11-10-51			36 mg.%
M.S.			
11-26-51			38 mg.%
E.S.			
10-25-51			42 mg.%
10-27-51	330 mg.%	18 mg.%	
10-30-51			39 mg.%
11-13-51			57 mg.%
11-26-51			41 mg.%

*HBG. 14.5 Grams = 100% Normal.

VENTILATORY MEASUREMENTS	Vital Capacity Predicted	Determined	Maximum Breathing Capacity Predicted (Liters/M)	Determined
M.S.				
11- 3-51	4147 cc.	2900 cc.	113.2 L./min.	66.4 L./min.
11-17-51		3200 cc.		82.0 L./min.
11-24-51		3450 cc.		84.0 L./min.
12- 8-51		3850 cc.		90.0 L./min.
C.L.				
10-30-51	4300 cc.	2700 cc.	128.6 L./min.	79.2 L./min.
11-10-51		3900 cc.		96.0 L./min.
M.S. (clerical)				
10-27-51	3200 cc.	2800 cc.	109.6 L./min.	91.8 L./min.
E.S.				
11- 2-51	4046 cc.	2300 cc.	132.6 L./min.	65.0 L./Min.
11-17-51		2900 cc.		77.2 L./min.
11-26-51		3300 cc.		93.6 L./min.
12-10-51		3450 cc.		90.5 L./min.

URINALYSIS	SP. GR.	ALB.	CHO	Microscopic	Cadmium Recovered Micrograms/Liter*
M.S.					
10-25-51	1.034	neg.	neg.	rare pus cell	29.0 mug./liter
10-27-51	1.036	neg.	neg.	rare pus cell	50.0 mug./liter
10-29-51	1.035	2+	neg.	1-3 pus cell	20.0 mug./liter
10-31-51	1.032	neg.	neg.	rare pus cell	
11- 3-51	1.030	neg.	neg.	rare pus cell	19.0 mug./liter
11- 9-51	1.030	neg.	neg.	rare pus cell	10.0 mug./liter
11-17-51	1.026	neg.	neg.	rare pus cell	Less than 10 mug./liter
11-24-51	1.026	neg.	neg.	negative	0.0 mug./liter
C.L.					
10-26-51	1.026	neg.	neg.	crystalline debris	12.0 mug./liter
10-27-51	1.026	neg.	neg.	crystalline debris	56.0 mug./liter
10-30-51	1.028	neg.	neg.	negative	17.0 mug./liter
11- 3-51	1.022	neg.	neg.	negative	
11-10-51	1.022	neg.	neg.	negative	10.0 mug./liter
M.S. (clerical)					
10-26-51	1.018	neg.	neg.	crystalline debris	0.0 mug./liter
10-27-51	1.016	neg.	neg.	crystalline debris	0.0 mug./liter
11-10-51	1.015	neg.	neg.	crystalline debris	0.0 mug./liter
E.S.					
10-25-51	1.036	neg.	neg.	rare pus cell, epithelial debris.	119.0 mug./liter
10-26-51	1.032	neg.	neg.	negative	60.0 mug./liter
10-28-51	1.032				56.0 mug./liter
10-30-51	1.030	neg.	neg.	crystalline debris	13.0 mug./liter
11- 2-51	1.024	neg.	neg.	rare pus cell	
11- 5-51	1.024	neg.	neg.	negative	10.0 mug./liter
11-17-51	1.024	neg.	neg.	negative	30.0 mug./liter
12-10-51	1.026	neg.	neg.	negative	16.0 mug./liter
12-27-51	1.024	neg.	neg.	negative	0.0 mug./liter

*Samples were spot collections with recovery values corrected for specific gravity to 1.024 and rounded to the nearest whole number.

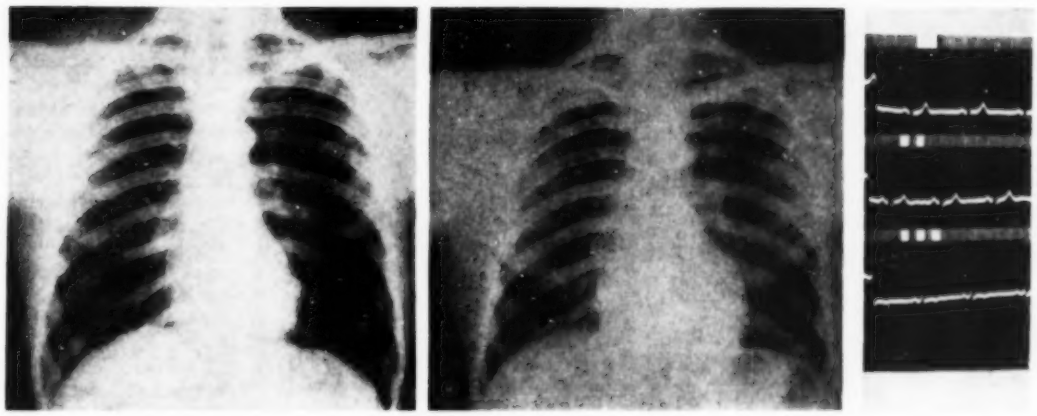

Fig. 1.

Preplacement Film 12-17-49 Post Exposure Film 10-25-51 EKG 10-26-51

upon which to base an opinion. Examination of the abdomen and extremities as well as an evaluation of the paired crainial nerves, peripheral reflex activity, and coordination, indicated no abnormalities that were not of obviously pre-existent status. An electrocardiogram made October 26, 1951, was normal except for a prominent sinus bradycardia (Fig. 1—63 per minute).

C.L. (maintenance helper), 18 year old white male, was intermittently exposed to cadmium oxide fume. It was estimated that his total exposure was somewhat less than 50% of that experienced by E.S. to whom he had been assigned as a helper. His complaint began shortly after the onset of the operation and consisted of mainly chilly sensations and a feeling of tightness and constriction within the chest. There was headache, and an irritating nonproductive cough. Abdominal discomfort was minimal. He was first seen on the morning of October 26, 1951, at which time he still complained of headache, cough, and tightness within his chest. Physical examination revealed a prominent injection of the nasopharynx and of the ocular conjunctivae. The lungs were clear and resonant throughout to direct physical examination. The heart sounds were normal. Oral temperature was 100° F (37.7° C). His complaints gradually subsided over the following week, after which he was able to resume his usual work. During the entire period of disability, no abnormal physical findings were noted over the lung fields. A chest film taken October 26, 1951, suggested a chemical pneumonitis when compared with the original preplacement film. Complete clearing of the lung fields by the same comparison was evident by November 10, 1951. An electrocardiogram made October 26, 1951, was entirely normal except for a sinus bradycardia (Fig. 2—rate 50 per minute).

M.S. (clerical worker), 30 year old white female, developed her initial complaint about an hour after the onset of the described operation. Initially there was a dull headache and then rapidly developing malaise. These complaints increased in severity over the ensuing 12 hours, with the addition of nausea, emesis, and cramp-

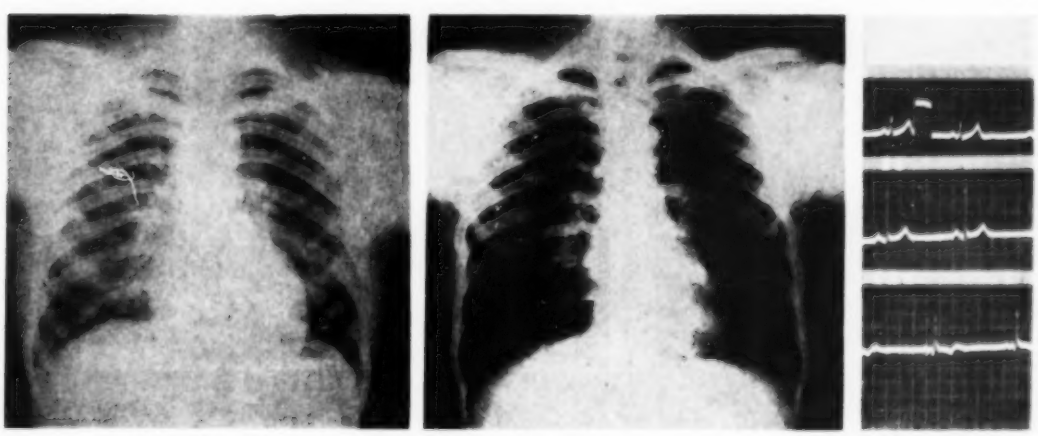

Fig. 2.

Exposure Film 10-26-51 Preplacement Film 12-12-50 EKG 10-26-51

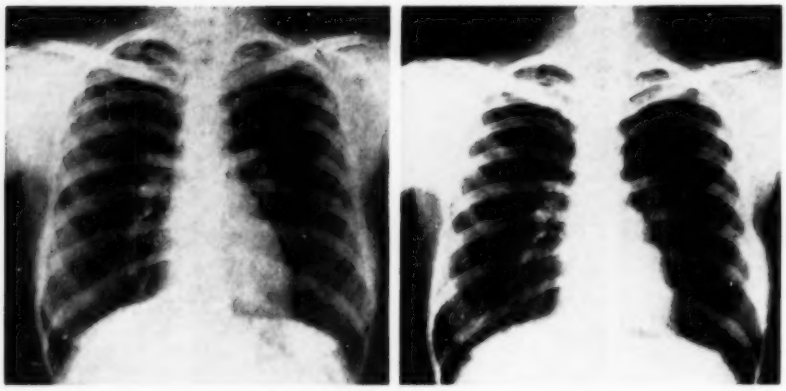

Fig. 3.

Post Exposure Film 10-26-51 Preplacement Film 2-27-51

like abdominal pains. During this same time she too complained of a persistent, irritating, nonproductive cough associated with some tightness of the chest. Examination October 25, 1951, indicated no elevation of temperature. Moderate injection of the nasopharyngeal and ocular conjunctivae was noted. Auscultation of the heart and lungs was entirely normal. Chest x-ray examination October 26, 1951, revealed a generalized increase in normal bronchovascular markings, particularly over the midzones and in the dependent portions of both lung fields. Upon comparing this film with a fairly recent periodic health survey film a diagnosis of chemical pneumonitis seemed in order. Complete clearing was evident by November 10, 1951. Disability did not continue beyond seven days, at which time she resumed her usual work (Fig. 3).

E.S. (maintenance welder), 42 year old white male, began his complaint several hours after the termination of exposure. Initially there were headache, sensation of chest constriction, and an irritating nonproductive cough. Late the same evening he became nauseated and had emesis several times. His cough then became productive of moderate amounts of white frothy sputum, not blood-tinged, and associated with increasing shortness of breath. These complaints and their sequence were verified upon his initial examination October 25, 1951. Oral temperature was 101° F (38.3° C). There was a marked injection of the nasopharyngeal and ocular conjunctivae. He was markedly dyspneic, even at rest. He appeared anxious. Facial color was best described as a "dirty cyanosis" in that he seemed almost as gray as he was blue. There was a prominent cyanosis about the lips. There was no distention of the return venous flow in the neck veins. Auscultation of the chest despite obvious difficulty revealed no abnormal findings. Heart tones were good, no murmurs and no accentuation of the pulmonic second sound were noted. Abdomen, extremities, and neurological examination were normal. E.S. was the only member of the exposed group hospitalized. Treatment was entirely symptomatic supplemented by oxygen and antibiotics. Despite an adequate concentration of oxygen within the tent there was essentially no change in dyspnea or his peculiar cyanosis for approximately 48 hours. By the second hospital day moist rales appeared in both bases upon auscultation of the chest, dyspnea and cough began to lessen, and color improved considerably. The cough was a major discomfort until after November 1, after which it rapidly disappeared. X-ray examination initially on Oc-

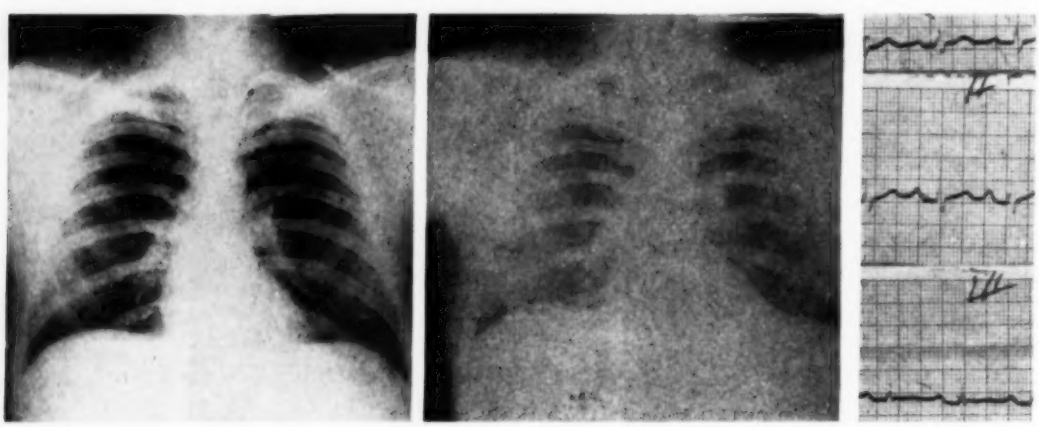

Fig. 4.

Post Exposure Film 11-17-51 Post Exposure Film 10-26-51

tober 25 revealed a diffuse chemical pneumonitis which by x-ray examination seemed to have cleared by November 17, 1951. General weakness was prominent during this period and by November 17, 1951, he had already lost 21 pounds in weight. An electrocardiogram made October 26, 1951, indicated a first degree heart block with a PR interval up to .24 seconds. Subsequent tracings indicated no increase or decrease in the conduction defect (Fig. 4).

During the third week of his disability E.S. began to complain of sharp, painful, deep boring sensations over both anterior thighs. This complaint continued for about three weeks, made walking almost impossible, and interfered with sleep at night. Mindful of reports[2] of comparable complaint associated with osseous change in the femora appearing in chronic cadmium exposures, E.S. was closely observed, by repeated examinations with particular attention to sensory and reflex activity for the lower extremities, oscillimetric studies of arterial supply, and serial x-ray studies of the areas of complaint. These studies were all normal. By December 10, 1951, E.S. had regained his weight and strength, was working, and was subjectively free of complaint.

On April 28, 1953, the personnel involved in this exposure (with the exception of the female clerical worker who had left her employment) were again examined in the course of a routine periodic health examination program. They were all doing their usual work, subjectively free of complaint, and objectively there was no evidence of any residual disability. Chest x-ray examinations were normal for each. There was some mild accentuation of the normal bronchovascular markings on the film of E.S. but it was felt that in view of his age this probably was entirely normal and pre-existed his exposure of October 24, 1951. Blood studies were within normal limits for all.

Environmental Survey

SEVERAL months after the above described exposure an opportunity was presented to make an environmental survey of the same operation, in an isolated location and employing the same materials, except that at this time local exhaust ventilation was provided over the revolving lathe spindle and the metallizing operator was supplied with an air line helmet. It was felt that the operation so conducted would be quite safe, but it was also important to determine the perimeter beyond which atmospheric contamination might be low enough to permit the assignment of other workers at miscellaneous jobs without personal protective equipment and without danger from air-borne cadmium. Adequate samples (air) were collected with both the standard and the midget impinger. The samples were quantitated colorimetrically, using diphenyl thiocarbizone as the complexing agent. The average values obtained were as follows:

A. Immediately above the work operation, outside the air line mask of the operator but at the breathing zone level. This represents the level of contamination to which the metallizing operator would be exposed if no air line helmet were employed. It differs however from the original exposure in that now local exhaust ventilation has been introduced:

Cadmium in air—1.109 mg/M^3.

B. Cadmium concentration within the air line helmet at the breathing zone of the operator.

Cadmium in air—0.0139 mg/M^3.

C. Cadmium concentration at a 10-foot perimeter from the operation:

Cadmium in air—0.151 mg/M^3.

Spot checks of the level of urinary excretion of cadmium were made upon the operator within the first three days of renewed operation. The maximum value obtained was 12 micrograms/liter of urine.

Despite the use of local exhaust it was noted that a level of contamination existed over the work area approximately 11 times the maximum allowable concentration for cadmium in air, and that at the 10-foot perimeter the levels were barely acceptable. Since the operation was usually a short one, relatively infrequent, now isolated, and the operator well protected, it was felt that simple exclusion of other workers from the area would be sufficient to control the hazard. Instruction, however, was given to refrain from using the area for storage purposes and to provide suitable protection for workmen during clean-up operations.

Comment

SOME features of this exposure are worthy of further elaboration. As indicated in the earlier portion of the report, the physical and chemical states of the entrained cadmium were not the same for all the exposed personnel, yet the clinical features of their disease were much alike, varying only in degree. Their complaints differed from those usually encountered in metal fume poisoning in that they were more intense, prolonged, and unassociated with the usual marked fever and chills seen in zinc fume fever.

The blood pictures are indicative of more widespread systemic involvement. Initially one finds a mild hemoconcentration associated with a moderate-to-marked leucocytosis which then resumes a more normal balance between lymphocytes and granulocytes as recovery progresses.

The elimination of cadmium is slow and quite protracted. This would suggest a rather tenacious binding in the tissues which, though yielding up the major portion of the absorbed cadmium early, is reluctant to surrender it all. Similar observations have been made by Harrison[3] who demonstrated persistent residual small amounts of cadmium in the lungs of dogs as long as 15 weeks after exposure to cadmium chloride aerosols.

Although the portal of entry in this exposure is the lungs, and there is some significant impairment in the ventilatory component of respira-

tion, it is apparent that the effect is not primarily respiratory.

One might postulate a more widespread effect predicated mainly upon the binding effect of the cadmium ion on the sulfhydryl portion of the acetyl cholinesterase enzyme molecule. Cadmium is not alone in the power to bind or to inactivate the —SH portion of the sulfhydryl enzymes. Many metals, particularly the heavy metals, have the capacity to form enzyme mercaptides. Binding the cholinesterase would permit the cholinergic effect of acetyl choline to develop. One may then anticipate the bradycardia, heart block, abdominal pain, nausea, emesis, coughing, and sensations of chest constriction such as manifested themselves among members of this group. It is unfortunate that one thinks much better in retrospect than when actively immersed in a problem such as this. Were this not so, it might have been possible to make additional observations clinically or in the laboratory during the active course of disease to test this hypothesis.

No attempt was made to treat any of the exposed personnel with BAL, since it was felt that the clinical problem was not of such magnitude as to warrant risking the untoward effects of formation and excretion of the BAL cadmium complex. E.S. did receive some reducing substance as cevitamic acid but it was impossible to evaluate its effect, if any, upon the course of his disease.

Summary

A CLINICAL report of a group exposure to cadmium is presented. Recovery of all exposed personnel has been complete without residual disability. It is suggested that the inactivation of the sulfhydryl enzyme, acetyl cholinesterase, by cadmium may be responsible for the clinical evidence of disease.

(755 Tonawanda Street.)

References

1. Analysis of cadmium wire: cadmium, 99.9%; lead, copper, iron and zinc, 0.01% each.

2. LAFITTE, A., and GROS, R.: Les Lesions Osseuses de l'Intoxication Chronique par le Cadmium. *Presse med.*, June 20, 1942, p. 399.

3. HARRISON et al: Inhalation of Cadmium Aerosols and Treatment with BAL. *J. Ind. Hyg. & Tox.*, (September) 1947.

Philosophy of the First-Rate

THERE is a philosophy which gives standards of value and judgment that apply to all spheres and activities of human life. It is a very simple one, and no one would reject it. I would call it the Philosophy of the First-Rate. Ask a doctor or a surgeon if he is ignorant of, or indifferent to, the best methods in his profession. Would he answer yes? Or would he consider that there are no differences of quality in art, literature, music, architecture, and that it does not matter whether a picture or a sonata or a play or a building is first-rate or third-rate? Or, taking the inquiry into a still more important province, do we think that when we apply the words good or bad to human character and conduct we are drawing meaningless and unimportant distinctions? In all fields of life all people, whatever their creed or race, admit what I called the philosophy of the first-rate. I have already quoted John Morley's saying that an educated man knew when a thing was proved and that an uneducated man did not know. I would prefer to say that an educated man knows, and an uneducated man does not know, what is first-rate, and that the best-educated man is he who knows the first-rate in the most important human activities. The supremacy of the first-rate is a self-evident axiom. But it is sometimes an unrealized axiom. We are like the slave in the *Meno*, who had the principles of geometry latent in his mind, but never recognized them till Socrates played the midwife and brought his subconscious knowledge to the birth. For our purpose education must be the midwife—the metaphor suggests one of the most fruitful and fundamental conceptions in that field—and bring to birth this philosophy of the first-rate, which is so fruitful and which no human being would disown.

—From "What Is Education?" by SIR RICHARD LIVINGSTONE, M.A. HON. D. LITT., HON. LL.D., in *Connecticut State Med. J.*, 17:10, 811 (October) 1953.

The Painful Elbow

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AN INSIDIOUS condition of the elbow which is found with relative frequency in heavy industry is epicondylitis. This is a periostitis of the bone, affecting either the medical or lateral epicondyle of the humerus, usually with some concomitant involvement of the nerves surrounding the area; the median, the radial and/or the ulnar. The radio-humeral ligaments and even the bursae may be involved. This is a cumulative effect, because always it is the result of repeated bruising of the affected elbow, and is finally precipitated by a moderately severe contusion. The condition is chronic and unyielding, long lasting, and resistant to treatment. It causes moderate pain, and at the beginning even exquisite tenderness. Motion of the arm and forearm may tend to be limited, but it is not definitely restricted. The pain shoots up and down the arm and forearm from the lateral or medial epicondyle, and usually is intensified by grasping or lifting with the extended forearm.

During the last two years, we have diagnosed and treated about 20 such cases. The most remarkable point involved with the condition is its chronicity, and slow or negative response to therapy. Time is the most important factor; with passage of time improvement is automatically achieved. The bursae rarely become involved ostensibly to the extent of aspiration. Disability in days lost is unusual, but may be brought about by a disturbance of the embryological cartilage cells of the anterior capsule with production of bone, or we may have hyperemia with bone rarification and resulting pain and disability.

Following is a resumé of three typical cases:

CASE I. A rigger, for 14 years, age 49. Hit right elbow. Did not report injury for two days. Pain over radial epicondylar ridge, with exquisite tenderness. Slight effusion into joint, with some apparent thickening of the skin over the area. Motion good but painful. Pain along forearm on grasping. Treated almost daily for two weeks with infrared and microtherm. The following two weeks treated with novocaine injections into the radio-humeral ligaments, three times weekly. After this therapy, pain and tenderness still present but bearable. Reported back after three months, then two months later. There was still some tenderness at the epicondylar ridge on pressure, but the radiating pain was gone. The effusion cleared, and motion was good. This presents a mild case with no lost time. The symptoms of pain and tenderness at three and five months accentuate the chronicity of the condition. The patient did not return to the clinic for further treatment, in spite of discomfort at the elbow, because pain at the later stage was aggravated above threshold only by pressure over epicondyle. Therefore, barring pressure or accident to elbow, this patient is "cured."

CASE II. Welder for eight years, age 41. Reported a contusion of the left elbow, one day late. There was no swelling, and no limitation of motion. There was pain down the elbow on grasping, and with movements of the fingers on the ulnar side. Also, there was numbness of the little finger, and pressure over the medial epicondyle increased the pain and the feeling of numbness of the little finger. X-rays revealed a suggestion of periosteal reaction along the medial epicondylar ridge. The condition was diagnosed by the orthopedist as periostitis of the medical humeral epicondyle. Infrared and microtherm were administered almost daily for two weeks with minor relief. For the next three weeks, three times weekly, novocaine infiltration at the elbow provided only temporary relief. The orthopedist then advised immobilization of the arm and forearm by means of plaster splints, with padding. This avoided any pressure to the affected area. Time lost from work while immobilized was 10 days. On removal of the cast the patient felt better for about two days only. The tenderness was never really gone. Repeat x-rays showed no change. Seven months after injury the discomfort at the elbow remains.

CASE III. This man, a burner for 12 years, age 39, was first seen in May, 1951. Struck posterior aspect of flexed right elbow against steel bulkhead. X-rays were negative other than suggestion of periostial involvement, lateral-humeral epicondylar periostitis. There was pain with flexion or extension motion of arm. The patient was treated with infrared and microtherm four or five times weekly during May, June, July, and August. During September and October novocaine injections were administered twice weekly. The orthopedist advised x-ray therapy. Six x-ray treatments were given in October, 1951. The patient felt slight improvement from the therapy, but within four or five days his condition was as before as regards the elbow proper, but the radiating pain was diminished. He reported to the clinic every two or three months, claiming discomfort and slight pain over his elbow. As of September 18, 1953, the discomfort due to the elbow was slight, however, the external epicondyle was still tender to pressure, and painful even from the lightest contusion. Disability none.

Comment

THERE is question whether in these cases which appear to be similar, all are caused by the same factors. Are the bursae always involved? Are the nerves and ligaments always injured? It appears from our observations that these structures are always involved but to a different degree in each case, which makes one case more severe than the next. It is especially noted that, in our cases, we observed no definite proliferation of bony tissue from the injured periostium.

Epicondylitis is not a disabling condition. Medical aid is rarely sought promptly, but usually a day or two late. It is noted that lateral rather than medical epicondylitis predominates, and that the right elbow is injured much more often than the left. Patients always have been able to work with this condition unless the arm and forearm were splinted. The numerous therapies used all proved at most only of temporary value, or as a means of tiding over the acute stage. Even cases with minimal therapy, over passage of time showed almost the same improvement. Therefore therapy is of benefiit only for the acute stage. X-ray therapy is of questionable value and is not advised. The condition after the acute stage, which varied in our cases from about four weeks to four months, appears to become static. This is so even in our older cases of two years or more.

Summary

EPICONDYLITIS is a condition causing much discomfort, but no lost time. There is loss of efficiency but no disability. The Workmen's Compensation Commission's final opinion in the three cases presented, and others, was always: 'discomfort over the elbow region, no disability. Maximum medical benefits achieved. Patient may do usual work. Award none.'

Of specific therapy there is none; palliatives are many. The use of the various therapies is a problem for the individual physician. Though their efficacy is problematical, as psychic and analgesic aids they are of value during the acute stage. Prophylaxis and safety are our 'forte.'

(Bethlehem Steel Company, Shipbuilding Division.)

Savings From Safety

SAFETY activities in general are predicated upon the assumption that they are less expensive than accidents. Broadly, considering the human values and the indirect costs of injuries, there can be little doubt of the validity of that assumption. It has been documented, too, in records of the National Safety Council, which contain ample evidence of the savings achieved through safety activity. For example, one large company, operating four plants, reduced its annual costs for medical examinations, first aid, and compensation from more than $20,000 to $1,900 in four years; and intensive safety work undertaken by a construction company saved $33,456 within six months of its inception. Neither savings nor cost of safety programs are limited to compensation. It is difficult if not impossible to obtain comprehensive figures on costs, principally because they are so widely distributed that isolation is difficult. Some indication of this, as well as of the vast savings which can be achieved in compensation costs, can be drawn from the recent experience of the Bureau of Ships of the Department of the Navy. As a result of an intensive program, the Bureau of Ships succeeded in reducing the number of deaths resulting from work injuries from 100 in 1946 to four in 1951. According to the Bureau of Employees' Compensation of the Department of Labor, the cost of compensation and medical care in fatal injuries to Federal employees averages $35,000. Thus, had the Bureau of Ships' 1946 death toll persisted, it would have cost the Federal Government $3,500,000 in 1951, so that the actual reduction in deaths saved $3,360,000 in the latter year alone. Concurrently, the Bureau reduced its injury-frequency rate from 20 in 1946 to five in 1951, thereby considerably increasing the savings.

—From "Workmen's Compensation in the United States: VI—Accident Prevention," by WILLIAM L. CONNOLLY, in *Monthly Labor Review*, October, 1953.

Radiation Injury and the Present Status of Therapeutics

A BIBLIOGRAPHIC REVIEW

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THE treatment of radiation injury is in a highly confused state because of the multiplicity of conflicting research reports and the failure to analyze the over-all aspects of the use of any particular therapeutic agent. In 1951, Durham, Cronkite, Le Roy and Warren[1] pointed out that there was insufficient evidence available to warrant stockpiling such therapeutic agents as flavonoid compounds, toluidine blue, protamine, or vitamin B_{12}. On the other hand, the usefulness of antibiotics and transfusions in the treatment of radiation injury seemed to be well established. The purpose of this discussion is to review the latest work in the field of radiation injury and attempt to establish a pharmacological basis for the therapeutic use of the various agents proposed for the treatment of radiation injury and to point out the possible hazards which might be encountered in their use.

Rutin and other flavonoid compounds were originally used for their supposed benefits in prevention of capillary hemorrhage.[2] The pharmacological basis of this therapeutic application was the demonstration by Haley, Clark and Geissman[3] of the vasoconstrictor action of these compounds on the precapillary sphincters and terminal arterioles. Ambrose and DeEds[4] showed that these compounds also modified capillary permeability, and Haley and Rhodes[5] confirmed this effect. Such effects on the peripheral vascular system should assist in controlling that phase of the radiation syndrome which gives rise to petechial hemorrhages but available evidence indicates that the flavonoids are not beneficial in radiation injury. Rekers and Field[6] reported that rutin modified radiation damage and decreased its lethality in dogs but not in rats. However, Griffith, *et al*[7] found the drug beneficial in rats. On the other hand, Kohn, Robinette and Capp[8] reported rutin ineffective in rats and Cronkite, *et al*[9] obtained similar results in mice. A citrus flavonoid was reported by Sokoloff, *et al*[10] to decrease radiation lethality in rats but Cronkite, *et al*[11] found it of no benefit in mice. Clark, *et al*[12] reported that "calcium flavonate" decreased radiation mortality in guinea pigs but Clark and MacKay[13] later reported that it was highly unlikely that enough of the drug was absorbed to produce the effects reported. Working with a large series of flavonoids, Coon and Dauer[14] reported that none of the compounds was beneficial in mice, rats, or guinea pigs. Haley and Mann[15] confirmed these observations and showed that post-irradiation medication with rutin significantly increased the rate of mortality. Furthermore, none of the compounds studied had any beneficial effects whatsoever. Upon the basis of the available experimental evidence, it must be concluded that flavonoid medication is of no real benefit in the treatment of radiation injury.

The use of toluidine blue was proposed by Allen, *et al*[16-18] and proved to be effective in counteracting the incoagulability of the blood which occurs after acute whole body irradiation or nitrogen mustard therapy. However, the extensive toxicological and pharmacological studies of Haley, *et al*[19-25] indicate that toluidine blue and related dyes have several undesirable features which must be considered if they are to be used in therapy. All of the dyes are moderately toxic. The range of dosage for heparin inactivation is very narrow and a small increase in dosage will result in a greater coagulation defect because the dyes themselves are anticoagulants. Toluidine blue produces hyperthermia both in animals and in humans. Protamine has been found useful in the treatment of the coagulation defect in radiation injury[16-18] although there is the possibility of untoward reactions, hypotension, and allergic manifestations from this drug.[26] The above therapy is based upon the assumption that the coagulation defect is the result of an increased blood heparin, but experimental work thus far reported does not support this assumption. The coagulation defect is more related to damage to the various enzymatic processes involved in the conversion of the various elements involved in the formation and retraction of the clot formed at the hemorrhagic site. Jackson, Cronkite, Le Roy and Halpern[27] believe that the platelet destruction produced as a result of whole body

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irradiation is one of the largest factors involved and their work with platelet transfusions would tend to support such a thesis. However, platelet transfusions do not seem to be a practical solution to the problem because of the small amounts of material available and the possibility that the number of casualties requiring such treatment would be extremely large. Investigations now in progress may evolve an answer by developing quantity production of a stable synthetic material of low toxicity.

Generalized infection by organisms normally present in the lower intestinal tract is one of the largest factors contributing to death from radiation injury.[28,29] The antibiotics have been shown to be extremely effective in counteracting this phase of the radiation syndrome in irradiated animals.[30-37] In general aureomycin, streptomycin, chloramphenicol and terramycin or combinations of these drugs have proved effective except when the infection was produced by Pseudomonas, Proteus or Salmonella[37] Polymyxin, which seems to be specific for these organisms, was too toxic. The development of antibiotic resistant strains of bacteria must also be considered, and the generalized promiscuous use of antibiotics in the treatment of non-specific illness may result in the negation of all efforts to control the bacteremia phase of the radiation syndrome. The present trend in antibiotic research, seeking more specific rather than broad spectrum drugs, will undoubtedly result in agents which will have a direct affect on those organisms not as yet controlled by antibiotic therapy.

Blood transfusions appeared to be one of the best treatments for radiation injury in that such procedures cellular components as well as circulating fluid volume. However, Allen *et al*[38] have recently shown that matched blood is essential if any benefit is to be derived from such treatment. On the other hand, the exact status of transfusions in radiation treatment must be further clarified because Furth *et al*[39] showed that equivocal results are often obtained in experimental animals. The electrolyte balance is upset in the radiated animal because of the over-all cell destruction and the use of transfusions may be counterindicated unless the potassium-sodium ratio in the blood is known prior to transfusion. As yet too little is known concerning the usefulness of plasma volume expanders in treating the blood loss produced by whole body irradiation. However, such products which restore the circulating fluid volume are of little value in counteracting the anemia resulting from massive hemorrhage. Furthermore, it is not known whether the irradiated animal is sensitive to plasma volume expanders, although Detrick *et al*[40] have shown that the radiated animal cannot tolerate oxypolygelatin solutions. Routine blood counts, blood volume determinations and hematocrit readings are essential for the proper use of whole blood, blood plasma and plasma volume expanders or any combination of these substances.

Patt *et al*[41-43] have obtained dramatic results using pre-treatment with cysteine and this protection of irradiated animals has been confirmed by many other workers.[44-46] It has been observed that the protective action of cysteine is proportional to the dosages of both cysteine and radiation but the dosages of cysteine are definitely within the toxic range for that compound. Furthermore, only pre-treatment is effective, and it is doubtful that the treatment could be used in humans under such circumstances. However, cysteine protection will assist investigators in studying the late effects of acute whole body irradiation and an insight into the various changes occurring after the acute phase of radiation injury may result in a rational treatment being developed. The anoxia protection observed by Dowdy, Bennett and Chastain[47] is also an excellent tool for studying late radiation effects and these investigators have observed not only an accelerated aging process but the development of chronic nephritis and hypertension in animals which have survived doses as large as 1000 r.[48] However, neither pre-treatment with cysteine or acute anoxia can be considered practical solutions to the problem of protection from the harmful effects of acute whole body irradiation.

The pituitary-adrenal response to radiation injury follows the usual pattern obtained in any stressing condition[49] and may be considered as being a part of the general adaptation syndrome.[57] Ellinger[53-55] claims desoxycorticoserone acetate increases the chances for survival after acute whole body irradiation but only Edelmann[50] has been able to confirm this observation. On the other hand, other investigators[56,57] have shown that neither ACTH nor Cortisone was able to increase survival time or decrease total radiaiton mortality. In fact the latter compound increased the mortality. Adrenal cortical tissue exhaustion from excess ACTH output by the pituitary during the first post-irradiation week or direct cellular damage of the adrenal cortex by the radiation might call for injection of whole adrenal cortex extract immediately after acute whole body irradiation. Edelmann and Katsh[58-60] feel that chances for survival are increased if this need for adrenal cortical hormones is satisfied during the first post-irradiation week. Thus upon the basis of the available evidence, it cannot be concluded that adrenal cortical steroid therapy is not useful in the over-all treatment of radiation injury but that its proper place has as yet not been established.

Recent studies by Jacobson *et al*[61,62] on the role of the spleen in radiation injury indicate that this organ is vitally concerned with survival. Spleen protection greatly reduces radiation anemia although it does not prevent the marked and sustained decrease in the amount of lymphoid tissue. The implantation of non-radiated embryonic spleens into irradiated animals results in complete protection from the lethal effects of irradiation in the animal and a rapid recovery of hem-

atopoietic functions. Work now in progress may result in the isolation of the factor(s) responsible for this protection or may point out that cellular constituents are essential for activity. Only the future can decide the value of and proper place of spleen extracts in radiation injury therapeutics.

Summary

THIS brief discussion has outlined some of the progress to date in the treatment of radiation injury and serves to point out that such treatment must of necessity be a multiple one because the damage produced by ionizing radiation is multiple, involving almost every body tissue. Treatment must not be of a "shotgun" nature but must be devised to counteract each successive phase of radiation injury as clinical symptoms manifest themselves. Upon the basis of available evidence it must be concluded that flavonoid medication is of little or no value in radiation injury therapy, and that toluidine blue should only be used as a last resort because of the serious side reactions associated with its employment. The exact place in radiation injury therapeutics of such agents as blood transfusions, plasma volume extenders and adrenal cortical steroid hormones remains to be determined. Some of the broad spectrum antibiotics are beneficial in radiation injury but more specific agents are needed to counteract the bacteremia produced by certain intestinal organisms.

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Occupational Health

TO REUNITE man, industry, and psychiatry, I would like to close with Dr. Donald Stewart's definition of our field: "Occupational health is that aspect of medical practice concerned, among other things, with achieving harmony between the capacities of any individual and the demands of his occupation. Inevitably it must take heed of qualities of mind and temperament as well as organic health; and from that point it spreads to embrace group reactions and attitudes and the consequences of these to the individual, to the worker group, and even to society at large."

—From "Progressive Industry and the Worried Employee," by JEAN SPENCER FELTON, M.D., in *Mental Hygiene*, October, 1953.

Lead and Lead Poisoning in Early America

—THE PEWTER ERA—

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This is the third of a series of nine items, the totality of which constitutes a substantial history of lead and lead poisoning in early America. The remaining items will appear in consecutive issues of this Journal. DR. MCCORD *is Consultant, Institute of Industrial Health, University of Michigan, Ann Arbor.*

ARDENT devotees of the pewter arts may deny that the pewter period ever came to an end. Avoiding that issue, it remains that the seventeenth and eighteenth centuries represent a time, both for Europe and America, in which pewter ware was commonplace in everyday household affairs. Contemporary pewter, much of which is lead free and much called britannia ware, runs to the ornate and decorative rather than utile. Not so in the sixteen and seventeen hundreds. Much pewter was imported from Europe, but among the American colonists, pewter object-making was a household affair. In all communities a few of the neighbors possessed molds and these were loaned about as the need arose. Besides molding, flat items were hammered from pewter sheets, and some utensils were first shaped in sections from sheet metal, then soldered into final fashion. Teapots, mugs, creamers, tankards, platters, trenchers, basins and pitchers are representative of the utensils likely to come into contact with foods or beverages. In the crude molding operations, scant opportunity for exposure normally would arise due to low temperatures, but in the abrading finishing of cast metal, things may have been different. Still, use, rather than the making, provided exposure.

Just what pewter is defies simple definition. To the metallurgist, pewter is any one of a series of alloys in which tin is the dominant metal hardened by small additions of antimony, copper and bismuth. By popular consent, pewter is an alloy of tin and lead, the latter at a level of about 10%. Among the colonists, pewter was any metal that might be shaped into useful objects with the meager facilities available. At times all was lead, and a 50% lead content was common. To worsen the matter, one pewter was called "alchemy," a word not included in the dictionary. This was a mixture of tin and metallic arsenic, a pernicious combination of any domestic use.

A few writers of the land, more versed in history than in metallurgy, foolishly refer to the mining of pewter. One might as well allude to the mining of brass—brass being a man-made alloy of zinc and copper. Always pewter is man-made.

Mindful of the bad name attached to pewter because of lead poisoning, the present-day vogue is for lead-free pewters. Some manufacturers, aware of the sales appeal of the name "pewter," adhere to that term, but underscore "lead free." Others, more wary, rely on the ambiguities of "britannia metal" or "German Silver." In that famous book on industrial toxicology by Kober and Hayhurst, in a single chapter two strikingly dissimilar definitions of "britannia metal" are disingeniously provided. One is that it is an alloy consisting of 8-10% antimony, 0.3% copper and 90-92% tin. The other is that britannia metal is 50% copper, 25% nickel and 25% zinc. The first is representative of true lead-free pewter. The second is not pewter at all. No condemnation attends this unexplained diversity of definition, since convincingly it serves the immediate contenion that confusion in both the technical and popular minds surrounds definitions as to alloys, and this includes pewter. But, the pewter of colonial times contained lead and a lot of it. Lead in domestic utensils invites lead poisoning. And so, this recital.

Domestic Pewter

THE early settler was not the sort, nor was there opportunity, to have arrived accompanied by neat crates and barrels of deftly packed china and silverware. The truth is that some first lived in holes scooped out of the earth, with no utensils, dipping into common food pot, or relying on a hewn board or flat rock or sea shell for a plate or spoon. Some brought over pewter, which was common and cheap in Europe at the time. Larger numbers depended upon wooden utensils. The first step upward was from wood to pewter.

Pewter spoons were commonplace. Knives and forks could not be made from pewter. That metal was too soft. Pewter lent itself to spoons, mugs, plates, porringers, tankards, tobacco jars, lamps, candlesticks, and storage vessels for foods and alcoholics. Utensils of no type were plentiful, so that the traveler usually took with him his spoon, knife and fork.

Platters of pewter were plentiful, as well as trenchers. The sharing of dishes was the custom. When a deacon of a church provided a separate plate for every member of his family, he was "churched" because of such unseemly extravagance and display. When a maturing boy and girl not in the same family shared the same platter, this was regarded as the equivalent of an engagement announcement.

Alice Morse Earle (Home Life in Colonial Days) states:

"Pewter was a favorite material for lamps, as it was for all other domestic utensils. It was specially in favor for the lamps for shale oil and 'Porter's fluid' that preceded our present illuminating medium, petroleum.

"Pewter is a metal never seen for modern table furnishing . . . . but in colonial times what was called a garnish of pewter, i.e., a full set of pewter platters, plates, and dishes, was the pride of every good housekeeper, and also a favorite wedding gift . . . . One of the duties of children was to gather a kind of horse-tail rush which grew in the marshes, and, because it was used to scour pewter, was called scouring-rush.

"Pewter bottles of various sizes were sent to the Massachusetts Bay Colony in 1629. Governor Endicott had one, but they were certainly far from common. Dram cups, wine mugs, and funnels of pewter were also occasionally seen, but scarcely formed part of ordinary table furnishings. Metheglin cans and drinking mugs of pewter were found on nearly every table . . . . Among the pewter-lovers was the Revolutionary patriot, John Hancock, who hated the clatter of the porcelain plates."

She also supplies the inventory of Madam Olmstead's utensils in her 1640 Hartford, Connecticut, kitchen:

"2 Brasse skillets, 1 ladle, 1 candlestick and mortar all of brasse, 1 brasse pot.
7 small peuter dishes, 1 peuter bason, 6 porringers, 2 peuter candlesticks, 1 frudishe, 2 little sasers, 1 smale plate.
7 biger peuter dishes, 1 salt, 2 peuter cups, 1 peuter dram, 1 peuter bottel, 1 warmeing pan, 13 peuter spoons."

N. Hudson Moore says:

"From almost the very first there are plenty of records of pewter. In 1647, when the widow Coyte-more married John Winthrop, she brought to him from the estate of her late husband, pewter valued at one hundred and thirty-five pounds."

Mary Earle Gould, in "Early American Wooden Ware and Other Kitchen Utensils," relates the following about wooden ware:

"Wooden tableware was not used exclusively in those early homes. The well-to-do families had china and pewter, brought or sent from across the water. The houses and furnishings of the families of wealth and nobility were in keeping with their finer ways of living. In such homes the wooden table ware would be found only in the servants' quarters and the kitchens. In the homes of the middle class and of those living in the rural sections wooden ware was the general thing—the 'best' dishes of china and pewter lying in the cupboards and dressers waiting for 'company.'"

The place of pewter in the social stratum well is set forth by Benjamin Franklin in writing about his early mature years after his marriage:

"We have an English proverb that says, 'He that would thrive, must ask his wife.' It was lucky for me that I had one as much disposed to industry and frugality as myself . . . . We kept no idle servants, our table was plain and simple, our furniture of the cheapest. For instance, my breakfast was for a long time bread and milk (no tea), and I ate it out of a twopenny earthen porringer, with a pewter spoon. But mark how luxury will enter families, and make a progress, in spite of principle; being called one morning to breakfast, I found it in a china bowl, with a spoon of silver! They had been bought for me without my knowledge by my wife, and had cost her the enormous sum of three and twenty shillings; for which she had no other excuse or apology to make, but that she thought HER husband deserved a silver spoon and china bowl as well as any of his neighbours. This was the first appearance of plate and china in our house; which afterwards, in a course of years, as our wealth increased, augmented gradually to several hundred pounds in value."

Pewter Makers and Vendors

BY 1639 piddling work in pewter was going on in Boston. Chiefly the early pewterer was but a vendor of wares sent over from Europe. Some pewter repair occupied these pewterers. Because of the low temperature, little exposure to lead vapors arose. Repair work and the joining of cast, small parts into larger utensils required soldering and subsequent grinding and filing to smoothness. This gave rise to lead dust and, thus, appreciably extended the exposure. Competing with pewter was earthenware. By 1635 Charleston had its potter in Philip Drinker, and Salem in William Vinson.

By 1650 and thereafter, pewterers were numerous both as makers and vendors. The molds were of plaster of Paris, sand, or metal. The tools of the pewterer, apart from his molds, heating pot, and source of heat were: blow pipe, planishing hammer, collet hammer, blocking horn, horn tip, wood mallet, punches, and chasing horn.

The beginning of pewter ware for domestic purposes far antedates the colonial period in America. Malcolm Bell states:

"In England at the beginning of the sixteenth century, pewter according to the Northumberland household book, was still considered too expensive to be common, but the trade had nevertheless grown to be so important and the temptations to fraudulent practices so frequent that in 1503 an Act of Parliment (19 Henry VII c. 6) was passed

to compel every maker to mark his ware with a recognizable touch of his own, to forbid him to sell outside his own business premises except in open fair and market, and to put down the use of false weights and scales."

According to Kauffman, the oldest known specimens of pewter were excavated and may go back to the time of Roman occupation in the second century. Patens and chalices for church communion services were in use. The wines for communion purposes were capable of dissolving lead, but actual risks were minimal, since communion ordinarily is not a daily practice.

Harold Donaldson Eberlein, in "Early American Pewter," says:

"Boston during the first part of the colonial period was the chief distributing centre of British pewter, as well as the chief seat of pewter manufacture."

Some pewterers of the Colonial period as listed by Kerfoot are presented:

Richard Graves, Salem,	1635-69
Thomas Bumpsteed, Boston	1654
Henry Shrimpton, Boston,	1665 (dealer?)
John Comer, Boston,	1678
Thomas Clarke, Boston,	1683
Samuel Grame, Boston,	17th century
William Horsewell, New York,	1708 (dealer?)
Simon Edgell, Philadelphia,	1718
James Everett, Philadelphia,	1718
John Holden (or Halden) New York,	1743

The centers of the importation, and afterwards also of the manufacture, of pewter ware in the colonies were Boston, Philadelphia, and New York, although a good deal was made in other parts of New England. In fact, some of the early manufacturers are still making pewter.

Often advertisements in colonial papers reflect the customs and practices of a people. Three such advertisements are revealing as to pewter:

"PEWTER WARE—Among otner items for sale by Abraham Wilson, peruke maker, are: pewter plates, dishes, basons and spoons, knives, and forks . . . .—*The New-York Gazette*, November 3, 1760."

"PEWTER BUTTONS—Runaway from Abigail Lord an Irish servant man . . . . 'Had on when he went away a light colour'd cloth jacket with home made pewter buttons' . . . .—*The New-York Gazette* and *The Weekly Mercury*, July 2, 1770."

"ROBERT BOYLE, Pewterer, At the sign of the Dish, next Door to Mr. Samuel Pell's; Makes and sells at the most reasonable rates, all sorts of pewter ware, wholesale or retail: He also makes worms for stills of all sizes, in a new and compleat way; likewise, hogshead, barrel or bottle cranes, with or without cocks; and the infusion pots, so much made use of in colds; as well as any uncommon thing in pewter, in any shape or form, that may be ordered; Likewise, all kinds of lead work for ships or houses, with due care and expedition. —*The New-York Mercury*, June 17, 1754."

Pewter and Lead Poisoning

THAT pewter may contain a deleterious agent, i.e., lead, seems to have been known to several classes of persons during the colonial years. Apart from the public, physicians may have been the least informed, or at best the least articulate. These physicians diagnosed symptoms and treated symptoms. Little were they devoted to the determination of precise etiology. They were content to diagnose a "flix" (flux), a fever, or the dry-gripes (dry belly-ach)—all of which are but symptoms. The modern physician confronted with a diarrhea might arrive upon a diagnoses of "colitis" and prove in the laboratory that the particular colitis was attributable to the presence and action of amoeba coli. The early colonial physicians, if they knew about lead poisoning, were strangely silent in their writings. When they were interrogated, they knew full well that the "dry-gripes" was a common affection throughout the land, but no one of them rose up with shoutings that household pewter was the source of much of it. So common was the knowledge as to frequency that periodicals carried advertisements for cures, and one detected by Dr. Samuel Abbott Green is now quoted:

"For the Good of the Public, a certain Person hath a secret Medicine which cures the Gravil and Cholick immediately, and Dry Belly Ach in a little Time; and restores the Use of the limbs again, (tho of never so long continuance) and is excellent for the Gout. Enquire of Mr. Samuel Gerrish, Bookseller, near the Brick Meeting House, over against the Town House in Boston. N.B. The Poor who are not able to pay for it, may have it gratis." (*New England Courant*, December, 1722.)

The tinsmiths of England during and before the colonial period were aware of the undesirable properties of any lead content in pewter. They sought to regulate the percentage in pewter, at times demanding its elimination as a constituent. Always one argument was, and a just one, the harmful properties of lead. The quality of pewter descended with the increased content of lead. As a rule this poor quality (triffle, sad ware, lay metal) was shipped off to America or was fashioned there. Firm was the belief that a percent of lead at or below 10% was harmless. The demand for lower percentages was admirable, but if the truth had been known, 10% was sufficient to have induced lead poisoning under many circumstances, since daily intake of so little as a milligram and a half of lead marks a comparative upper limit of safety. That quantity becomes near infinitestimal when it be realized that a milligram is but one sixty-fifth of a grain. As part of the folklore, not necessarily reaching into the remotest decades of colonial life, was the belief that milk to be churned could not be kept in pewter vessels because it would not "turn." Unknown to them was the fact that enough lead might be dissolved in milk to hamper the necessary lactic and butyric acid fermentation. Too,

they were aware that some food, such as cooked acid fruits or vegetables stored in copper vessels, would acquire a bright green halo after a few hours. Without apprehension, the green discoloration would be skimmed away and the food consumed. The dissolved lead left no such telltale colored ring, so that unknowingly the contaminated food was consumed and sometimes with evil consequences.

The actuality of lead poisoning from dissolved lead in pewter is fully established through the disasters attending the distillation of rum through pewter stills. That medical history has been included in another section of this series.

The 1723 enactment of the Massachusetts Bay Colony prohibiting the distillation of rum through pewter stills and still heads is remarkable and perplexing. It is remarkable that without any exciting precedent this protective legal measure quickly followed the complaint from North Carolina rum drinkers of ill effects produced by New England rum. It is perplexing that no information reveals the medical guidance leading to the enactment. Fitz, a modern medical writer (*New England Journal of Medicine*, April 12, 1934, 210:15:802) beguiled by this mystery, in fantasy seeks to construct what might have taken place just prior to 1723. Fitz would have us believe that a triumvirate of Boston notables schemed the enactment. These planners were John Clark, Cotton Mather, and Zabdiel Boylston. Clark was a well-trained physician active in Massachusetts politics, long having been a member of the Assembly and for a period its president. For Clark, a sort of fame was created by Dr. Fitz in this language: "There was scarcely an important funeral in Boston which Dr. Clark did not attend in some capacity." Besides this he had other qualifications. Cotton Mather, the brother-in-law of Dr. Clark. was the well known truculent professional agitator and gadfly of the period. Just as Clark, the physician, was "a good preacher," so Cotton Mather, the preacher, essayed some proficiency in the medical world. Zabdiel Boylston was Boston's silver doorknob physician. There is the triumvirate.

Fitz assumes that the first news of the North Carolina dry gripes reached Benjamin Franklin through newspaper communication. At that time Benjamin Franklin, just past 16 years, was editing the *New England Courant*, since its real editor, Franklin's brother, James, was in jail. It is surmised that Franklin, on his best behavior and not wanting to join his brother in the "pokey," may have taken his disturbing news to one of the triumvirate seeking advice as to the wisdom of publication, knowing that the rum distillers would be outraged. An aside is provided that Franklin may have visited some of the local distilleries and may have had his own notions as to the cause of dry gripes. All this seems to go too far in ascribing erudition to the precocious Franklin. If any more disclosures come to light about his youthful acquaintance with that malady, it may be suspected that in his neo-natal days, he may have protested his mother's use of the well known leaden nursing nipple.

Something still is missing—precise medical understanding of lead poisoning. Conveniently Dr. Fitz provides this in the assumption that Dr. Boylston lately had in hand a copy of Ramazzini's "Opera" compiled by his nephew Bartolomeo, printed in 1716 and promulgated the following year. Indeed, this would have furnished the triumvirate with a good description of lead poisoning. So armed, if in truth they were, the triumvirate, if it ever existed, set about the devization of Massachusetts' famous law. Real evidence is flimsy. It is established that in some manner Dr. Clark fostered the passage of the Massachusetts Act. It could have come about that Boylston had available Ramazzini's "Opera" and that he was competent to translate its Latin content. It is more likely that he may have had some familiarity with Ramazzini's "De Morbis Artificum," published in Italy in 1700, but translated into English by an anonymous writer in 1705. The flimsy reed upon which Fitz leans is his locating in the Boylston Medical Library in Cambridge a copy of the "Opera," but without indication of its source or prior ownership.

If indeed Ramazzini reached into Colonial America from his tomb in Padua and if indeed Benjamin Franklin was prime in paving the way for the Massachusetts Act, new laurels are added to two scientists in no need of any additional accolades.

All that happened in 1723 in Boston disclosing the treachery of lead could have influenced helpfully other applications of pewter, including its use in domestic life. That it did so and quickly is not apparent. Yet through slow percolations, by the year 1787 as recorded by Dr. Holyoke, for some reason the disease, dry-gripes, was on the wane.

So much attention has been focused upon George Baker's proof that Devonshire Colic derived from lead in cider mills that another significant portion of his total study widely has been overlooked. This was too late to have served the early colonists, but by 1767, he had proved that widespread in England and on the continent was the practice of storing foods and beverages in pewter containers and that lead poisoning as a result was rife. Still pertinent to the immediate interests were his records that deliberately lead, either as the metal or some of its compounds, was added to cider and alcoholics. Those adherents to this practice knew that unwanted fermentation of wines and cider would be retarded, but in full ignorance that life itself was being jeopardized.

All this is applicable to the American colonist's situation in their almost universal reliance upon pewter containers.

Allusion to harm from pewter is couched in the vaguest terms. Thus Richard B. Bailey, lately writing in "Antiques," (Pilgrim Possessions

1620-1640, March, 1952, 61:3:238) provides this information:

"Pewter and alchemy, the latter a metal of pan brass and arsenicum, also served in the manufacture of spoons, although alchemy is said to have developed a reputation for *unwholesomeness*, and eventually to have been given up."

Truly pewter many times was "unwholesome." In the instance cited, the unwholesomeness may have attended the arsenic almost unbelievable as a constituent in household utensils, but it may be recognized that at that period, neither arsenic nor tin was free from a content of lead. Since no one, including physicians, indentified the widespread dry-gripes with household pewter, the case to be made out in that domain largely must rest upon the consideration, in terms of present-day knowledge, as to whether lead poisoning could have arisen with some degree of frequency among the tens of thousands of users over practically two centuries. The solubility of lead today is not other than the solubility at any other time. It is well established that metallic lead, both as such and as alloyed with other metals such as tin, comparatively is soluble. The exact degree of solubility is well known, but those technicalities have no place in this present recital. Even some—but not all—drinking waters dissolve some lead. Acid foods, and in particular acid fruits such as applesauce, vegetables such as tomatoes when stored in leaden vessels, quickly are contaminated by dissolved metal. Milk dissolves some lead. Add to the list tea and vinegar. More active in the series are cider and the alcoholics. It is impossible to believe that lead in pewter always was harmless.

On all sides there are frequent references to the dry-gripes, but until the rum still episode, no discernible willingness to locate the sources of exposure. These were numerous, and the number includes pewter. Nowhere are there statistics —just allusions.

Criterion of Illness

WHETHER one judges a man to be sick must naturally depend upon one's criterion of illness. Would you agree with me that the concept of what constitutes illness has of late been too widely extended to include all types of maladjustment, unhappiness, and inefficiency—mild as well as severe? I think this danger has been fostered by fatuous definitions of health, of which that given by the World Health Organization seems to me a prize example. In the constitution of that body health is defined "as a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity." Since, however, nobody in this world is in a state of complete physical, mental and social well-being, everybody, according to this definition, must be sick; and, as we all know, in the mind of the man in the street, illness is equated with irresponsibility or at least diminished responsibility. Do you often hit the problem, as I do, of people assuming too readily that if they are unhappy they must be ill, or of executive authorities trying to pass the buck to the doctor in the case of simple, straightforward inefficiency? As regards the former, would you think I am correct in teaching medical students that the basic principle of mental hygiene is, or should be, that this world is a vale of tears and that a considerable degree of discomfort or unhappiness is normal enough, and throughout the ages has been the lot of mankind? And as regards the latter, the executive buck-passing problem, am I right to teach medical students that many individuals present social rather than medical problems, as in the case of the work-shy, and that we can and should say, after careful investigation in appropriate cases, that we can find no evidence of disease or any reason why a man should be discharged on medical grounds even if he is inefficient, or any medical reason why he should not work as the case may be? In brief, should we not teach medical students to be reasonably strict in our standards as to what constitutes sickness and our job?

—From "What Has Psychiatry to Contribute to Industry?" by DESMOND CURRAN, in *The Transactions of the Association of Industrial Medical Officers, London*, 3:1, 219 (April) 1953.

Prevention of Cardiac Disability

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THE application of rehabilitation techniques to persons afflicted with heart disease is by no means new,[1] but only during the past few years has this subject attracted any widespread attention. A significant step was taken with the establishment of the first Work Classification Unit for cardiac patients at Bellevue Hospital in New York in 1941.[2] The activities of this unit attracted little attention until after the close of World War II. A second unit, modeled after the original one at Bellevue, was organized in England, at the Manchester Royal Infirmary in 1948. Between 1950 and the present time, at least a dozen programs, under various names, but having similar objectives, have been set up in various parts of the United States; and a number of others are in the process of being organized. The basic feature of a work classification unit is a team-work approach, combining the activities of physician, vocational counselor, social worker, and psychologist (or psychiatrist).

Up to the present time, the major activities of existing work classification units, or clinics, have included:

1. Evaluating the physical capacities of unemployed cardiacs as an aid in proper selective job placement.
2. Advising rehabilitation agencies as to the suitability of training programs for cardiac patients.
3. Furnishing advice in relation to the return to work of employed persons who become temporarily disabled by heart disease.
4. Conducting research on the relationship of employment to the course of heart disease.
5. Developing and perfecting rehabilitation techniques.
6. Discovering that many persons who had been thought to have heart disease do not have it.
7. Educating physicians, employers, patients, and the general public to accept the fact that many cardiacs, if properly placed and kept under medical supervision, can successfully and safely continue in employment.

Although the activities listed above cover a wide range and have distinct value, there is no reason to conclude that they represent all of the important contributions that can be made in this field. The purpose of this article is to present, briefly, another procedure which may be worth developing. The idea originated with Miss Janet Pinner, Selective Placement Consultant of the New York State Employment Service, and was accepted for trial by the staff of the Bellevue Work Classification Unit.

From the Work Classification Unit, Bellevue Hospital and the School of Public Health, Columbia University, New York. This work was aided in part by a grant from the New York Heart Association.

IT IS well-known that cardiacs usually have apprehensions which may be so severe that they constitute a major disabling factor.[3] It is also well-known that physicians often impose unnecessarily severe restrictions on the physical activities of cardiac patients. Finally, it is known that many individuals, for one reason or another, believe that they have heart disease when actually they do not. With these thoughts in mind, examination at the Bellevue Work Classification Unit was offered to any member of a selected group of employees who had, or thought they had, a cardiac problem. A few case histories are presented to illustrate what can be accomplished through this approach.

CASE 1. P.G., male, age 30. Referred to the Work Classification Unit in April, 1953, with the following information: "Mr. G. is employed as an Assistant Interviewer in a local Unemployment Insurance office. His assignment consists of working one week at an information counter and on alternate weeks at a certification line. He sees on the average from 300-500 applicants per day. He likes his job and enjoys it. He is interested in determining whether the type of work he is doing is suitable to his physical condition. Mr. G. tells me that he has had palpitation of the heart for the past few years and that last year his doctor told him he had a heart murmur and to 'take it easy.' At the present time he is receiving no treatment for his cardiac condition and is going steadily to another doctor for 'ringing in the ear.' Mr. G. travels to work by subway, which takes 35 minutes. He lives in an apartment and must climb three flights of stairs to get to his apartment. However, he expects to move in the spring to a ground apartment. Mr. G. is single and lives at home with his folks."

Medical history obtained at the Work Classification Unit revealed that in March, 1952, after changing a tire on a car, the patient had experienced palpitation and a feeling of constriction of the throat. He visited a physician a week later, was told that he had a heart murmur, and was advised to "take it easy." An electrocardiogram was taken, and no specific treatment was prescribed. There had been no recurrence of symptoms since the episode in March, 1952. There was no history of rheumatic fever or other etiologic

factor for heart disease, but there had been several attacks of palpitation between 1943 and 1946 while Mr. G. was in military service.

Physical examination revealed a faint apical systolic murmur which did not change after exercise, and the EKG showed an incomplete right bundle branch block. The diagnosis was possible heart disease. There appeared to be no reason to impose any unusual limitations of physical activity, and the patient was so advised. Annual physical check-ups, however, were recommended.

COMMENT: This case illustrates the unnecessary imposition of restrictions in physical activity. The patient apparently gave a strict interpretation to the advice to "take it easy" and developed considerable anxiety about his heart. Reassurance that he could live a perfectly normal life was all that was necessary to remove the disability.

CASE 2. L.D., female, age 43. Referred to the Work Classification Unit in March, 1953, with the following information: "Miss D. is a rheumatic cardiac. She discovered this condition about 15 years ago when she had an operation for an ovarian cyst. At that time the doctor told her she had a heart condition. She claims she has had symptoms for the past two years—shortness of breath and occasional pains in the shoulder and arm. Miss D. is married but separated from her husband since 1943. She has a daughter, 23 years of age, who is in her last year in college. At the present time Miss D. is employed as a clerk in a statistical unit in a local employment office. She is doing clerical work on a sedentary basis. Her doctor told her to reduce her activities and do as little standing and walking as possible. There is an elevator in the building in which she works. She spends 40 cents a day carfare in order to avoid excessive subway stair climbing. Her doctor has also advised her to lose weight—at the present time she weighs 170 lbs.—and 'to relax.' She is taking medication for her diet. Miss D. is interested in knowing whether the job she is presently performing is suitable for her physical condition."

Medical history obtained at the Work Classification Unit revealed that heart disease had been discovered in 1938 at the time of a surgical operation. Dyspnea and precordial discomfort had been present since 1951. There was no history of rheumatic fever or any related etiologic factor.

Physical examination showed a systolic and diastolic murmur at the apex, and fluorscopy revealed enlargement of the left ventricle and auricle. There were no signs of congestive heart failure. The patient was found to be quite obese. The diagnosis was rheumatic type heart disease with mitral stenosis and insufficiency and moderate cardiac enlargement.

COMMENT: In this case it was felt that obesity was a major factor in causing the cardiac symptoms. There was no cardiac reason for limiting her occupational or ordinary day-to-day activities.

CASE 3. H.W., male, age 62. Referred to the Work Classification Unit in March, 1953, with the following information. "Mr. W. has worked for the past seven years as an Employment Interviewer in the stenographic section. His job consists of handling job orders from banks, insurance companies, and certified public accountants. From time to time, he may be called to visit employers in order to solicit job openings. He is presently working on an 8:30 to 4:30 shift, with a half hour for lunch. He climbs only one subway stairs in order to get to work. He is on a salt free diet and tries to get plenty of rest. He has been told by his doctor that he should avoid excitement whenever possible. Mr. W. dates his heart condition from 1947 when he had swelling in both legs from below the knee to the ankle. He visits his doctor once a month. He also dates a history of hypertension since 1947. He is presently under medication—takes digitalis once a day, and phenobarbital when under pressure. He was in a hospital in 1948 and 1950 for rest and check-up. His last electrocardiogram was made two years ago. Mr. W. has a superior rating as a worker with our organization and claims he works under pressure, but I am inclined to feel that he creates his own pressure. He has been married for the past 30 years, has no children, and lives at home with his wife. We are interested in knowing whether his present job is suitable for his physical condition."

Medical history obtained at the Work Classification Unit confirmed the knowledge of hypertension since 1947 with an attack of congestive heart failure at that time. Since then there has been moderate dyspnea and occasional precordial pain.

Physical examination revealed that hypertension was still present, accompanied by little or no cardiac enlargement. The EKG showed evidence of myocardial damage, and fluoroscopy showed sclerosis of the aorta. The diagnosis was hypertensive and arteriosclerotic heart disease.

COMMENT. This patient was advised to continue at his present job but to avoid stair climbing when possible and not attempt to do the work of two people.

IN RECENT years an increasing body of information has shown that many persons with heart disease are able to continue successfully to perform a wide variety of jobs with no adverse effect on the course of the disease.[4] Suitable placement, proper advice, and adequate medical supervision are all that are necessary. The personal physician can and should provide the last two of these three requirements and should confer with placement or personnel specialists in connection with the first. In localities where a Work Classification Unit has been established, the family doctor is in a position to obtain assistance if he feels the need for it.

The cases selected for presentation here illustrate some of the ways in which cardiac disability can be prevented. Case 1 had been partially

disabled through the imposition of unnecessary restrictions. The existence of heart disease at all in this case is open to serious question. In Case 2, although heart disease was definitely present, at least part of the symptoms could be explained on a non-cardiac basis, and consequently no severe limitation of activities was necessary. Case 3 was found to be working under unusual pressure. It seemed reasonable to advise further restrictions in this case in order to delay additional cardiac disability.

Present-day concepts of preventive medicine include disability limitation as an important activity. This calls for periodic evaluation of a patient's physical status in relation to his daily life and his occupation so that they remain in consonance. Imposition of unwarranted restrictions increases disability rather than limiting it. Insufficient restrictions may hasten the advent of complete disability or even death. It is the physician's job to steer his cardiac patients along the proper course.

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This May Become Important

TREND to watch in employee benefit field is spread of major medical expense insurance, sometimes known as "disaster" or "catastrophe" medical insurance. Since this type of coverage was introduced only a few years ago, the number of contracts in force is comparatively small. But it is growing. The *Employee Benefit Plan Review* recently reported that six insurance companies in the field cover a total of more than 200,000 employees in various firms, and there are at least another six insurers writing the policies. Coverage is designed to afford protection against the financial hazards of "medical disaster," the cases—commoner than most people realize—in which expenses run into thousands of dollars. It is designed to supplement, not supplant, regular group accident and health policies; hence it is usually written with a deductible—i.e., benefits begin after the first few hundred dollars have been spent on medical care. Contracts differ among insurance companies, but the way the coverage works may be illustrated by plans offered by Liberty Mutual, a pioneer in the field, which now writes policies for well over 300 different employers. Four of these pay 75% of all expenses above the deductible amount, up to a total of $5,000, with deductibles ranging from $300 to $1,000. (A larger deductible, of course, results in lower premium.) Also available are two plans which pay up to $2,000. Since the company offers the insurance only to firms for which it also writes regular A & H policies, program can be arranged so that major medical expense payments begin as soon as benefits of the basic policy are exhausted. Big advantage of this type of policy, aside from the large amounts it pays, is that benefits are unallocated. Most health policies specify separate limits for hospitalization, surgery, nursing care, etc. Thus the insured is reimbursed up to the maximum amount only if he requires all types of care covered in the policy. Under major medical expense, only one limit is set, and the money may be allocated as necessary in the individual case. In addition, the insured need not be disabled in order to collect. Cases in which a person requires expensive treatment but remains on the job are covered. Key men rather than entire work force are often covered since the insurance, still regarded as in the experimental stage, is as yet fairly expensive. Or the insurance may be provided for long-service employees. One small firm, Container Laboratories, Inc., New York, makes major medical expense insurance available to employees who earn more than $5,000 a year and those who have been with the company for five years or more. (Employer pays for employee coverage in this case; employee for his dependents.) Unions are showing interest. Coverage has been written into contracts by at least three CIO unions: Steelworkers, Oil Workers, and Electrical Workers.

—*Personnel Executives' Newsletter* (Deutsch & Shea), October 30, 1953.

Occupational Skin Problems

The Cincinnati Sessions as a Prototype of Industrial Medical Education

THE Medical College of the University of Cincinnati, on October 12-16, 1953, staged training sessions on Occupational Skin Problems for physicians.

The Sponsors were the Division of Occupational Health, U.S. Public Health Service, and the Department of Preventive Medicine and Industrial Health and the Department of Dermatology and Syphilology, College of Medicine, University of Cincinnati.

The leaders, outstanding in these sessions, were Drs. Donald J. Birmingham, Leon Goldman, Louis Schwartz, and Raymond S. Suskind.

The Pattern

ALL institutions engaged in education in occupational health long have realized that it is not sufficient to limit training to a small number of graduate trainees who may spend a few months or up to three years for training purposes. So urgent are the needs that clearly a responsibility arises promptly to reach large numbers of physicians and other groups, such as industrial nurses and safety engineers, and even more particularly general practitioners, all with intent of elevating the status of occupational health as nearly immediately as possible. At the present time at least five schools are engaged in formal training of industrial physicians. The yearly number of such persons completing prescribed courses is distressingly low, and perhaps always ranges between 15 and 30. Even of this small number a portion return to their homes in other countries for their professional pursuits. This is the output which is to be measured against the need of instructing to betterment some 140,000 physicians in private practice to the achievement of elevated capacity to participate in occupational health.

Without collaboration all, or nearly all, of the educational institutions in this field have arrived upon the instrument of brief intensive courses on the general or selective aspects of occupational health. This has been exemplified during the current year at Harvard through the Symposium on Industrial Medicine, at Michigan in its recent Conference on Expert and Technical Testimony in Medical and Health Problems, and now at Cincinnati with its Course in Occupational Skin Problems. At other colleges, and moreover at these same institutions just mentioned, other courses have been conducted, and there is no purpose to ignore any.

There is no newness in the mere fact of special conferences at the University level. Such conferences have been conducted on hundreds of topics and for decades. At the University of Michigan the School of Public Health, which is only in its early teens, now lists 59 titles for special conferences, but by no means have they always been directed to industrial health. The facts that the University of Cincinnati offered a course on occupational dermatoses, or that earlier the University of Michigan conducted a conference on noise, in themselves are not monumental. What is important is that now there has crystalized the practice of providing special brief courses related to occupational health as a device for reaching the personnel of industrial medicine and general practitioners who already long ago have completed their formal education. The pattern has been set. Next to the influence of published items in many scientific journals is the worth of these brief training periods. Although the number of those in attendance may be limited to a few score or at most a few hundred, the reach becomes far greater through published proceedings. After one recent conference, the sale of proceedings (at a substantial price) reached 2000 when the number of persons in attendance did not exceed 200.

Now recognizing the crystallization of an educational procedure in industrial health, it is far from desirable that any effort be made to standardize such activities. It is unimportant whether such training opportunity be designated a "discussional," a "conference," or an "inservice training course." It is relatively unimportant that these sessions appear sporadically or, instead, at fixed periods. What may be of value is to reveal some of the difficulties encountered, and, conversely, what experience has taught as a guide to future endeavors.

Past performance has disclosed that the greater difficulty is to reach the desired audience. Those persons believed to be in the greatest need of instruction, and chiefly having in mind the private practitioners of medicine, are little responsive to any overtures directed to enlarged capacities in dealing with problems in occupational health. All too often a sizable audience is made up of those easily recognized as already well qualified in the content of the course to be presented. A facet of the same situation is that more often than not these same persons attend the instruction provided even when little variation is introduced into the subject material.

The duration of the special training period involves difficulties unless the course proffered is described as fundamental and somewhat complete in character. Few physicians are willing to devote even as much as a full week away from their own pursuits. Two days, and often one day and a half, appears to be the optimum duration for these conferences. Moreover, the period such as two days selected within any one week imposes diverging opinion. Some are highly resentful if provisions made involve Saturday or Sunday. Among physicians the preference appears to be for mid-week periods. However, among industrial nurses there appears to be a distinct preference for sessions that begin mid-day on Friday and continue through Saturday.

At all times lability is in order as to the content of the instructions offered. In some instances courses have been limited to appraisal of the immediate situation in some particular aspect of occupational health, but otherwise some courses have been fashioned so as to start with the rudiments of the matter and work up to the immediate. Current experience seems to indicate a preference for the latter. In this connection it seems to have been observed that although no large sums of money may be required for staging these courses, the higher the registration fee, the greater the interest and the higher the attendance.

The eager faculty confronted with a task of covering with some degree of adequacy the topic of a course and having all too few hours available is prone to impose morning, noon and night sessions with little letup for scientific assimilation. For a single day, or a day and a half, this procedure may be meritorious, but for week long periods some doubt may be entertained. The most receptive of minds soon rebels.

Well-meaning arrangers often reach the belief that the most effective plan is to provide many speakers—as many as a dozen in a long day. The theory behind this obviously is that a variety of views are introduced, different personages are presented to the audience, and a poor speaker quickly is forgotten in the midst of several good ones. The student's point of view, experience shows, appears to be to the contrary. If an instructor be well informed it proves far less difficult to move along with him from topic to topic throughout a day or evening, or even a week. While a single instructor may not represent the optimum for any long period, three or four instead of 12 or 20 may prove advantageous.

The Prototype

THE course on industrial dermatoses as conducted at the University of Cincinnati has been chosen as a prototype of that which is becoming the procedure as to one much needed form of instruction in occupational health. The group responsible appears to have been most successful in assembling for a one-week period of intensive training a "student body" not representing what might be termed the "professional attenders" of meetings. These students were students in fact and were fully diligent. The instruction environment provided was not that of the convention but the classroom. Clearly that is a desideratum.

The Cincinnati program introduced an additional admirable feature. One of the great needs in acquainting the medical profession with occupational health is to provide opportunity for private practitioners to see industry with its materials, processes, machinery, and practices. The usual brief conference on occupational health all too often is satisfied when one plant tour is provided, and even with that one emphasis is on the Medical Department itself rather than on manufacturing. The Cincinnati group did nothing of the sort. Some eight different manufacturing establishments were made available so that those physicians not already acquainted with industry might see industrial diseases in the making—i.e., in the making unless suitable protective devices had been provided. This feature of instruction was of signal value in Cincinnati. Besides, such tours served to relieve the inevitable mental wear and tear of hour after hour instruction, however good.

No purpose would be served by recording the detailed program as provided at Cincinnati. This well-planned effort yielded responses and success. Admirably it served as the vehicle of this presentation which has had as its over-all purpose the recognition that spontaneously over the country there has come about the acceptance of the brief training period for private practitioners and others, in furthering the manifest immediate need for a better understanding and a fuller application of the best in occupational health.

Specialists

SMALLER companies may benefit especially from services of specialists. A Labor Department study a few days ago showed that most scientists and engineers were employed by big companies and that only 4% were working for firms employing less than 100 persons. The same ratio probably applies to auditors, researchers, personnel advisers, and other experts. . . . A firm with fewer than 100 employees just can't hire all the specialists it ought to have. But it doesn't have to! A small company can turn to fee-basis services and obtain talents that are comparable to those large corporations get in salaried departments. And for the end results, a small company may pay proportionately less.

—*The York Report*, November, 1953.

The 1953 Ramazzini Rendezvous

Lake Clear, New York

THE RAMAZZINIANS in numbers without precedent assembled for their 1953 sessions at Lake Clear in the Adirondack mountains of New York state, September 18 to 20. This assembly was under the responsibility of Dr. James H. Sterner, Eastman Kodak Company, and Dr. Lemuel C. McGee, Hercules Powder Company. The member honored with the presentation of the annual oration was Dr. Elston L. Belknap, of Milwaukee, Wisconsin. His oration was entitled, "Perspective on Lead Poisoning."

To outward appearances the Ramazzinians meet solely in dedication to a day or so of leisure and informaltiy. Actually no more earnest group in medicine assembles anywhere on an annual basis. More than one university enterprise every year seeks to bring together numerous industrial physicians on a familiar basis for the purpose of appraising current situations in industrial medicine and anticipating points for emphasis in the forthcoming year's enterprises. Without disparagement as to any of these helpful conferences, well it may be believed that the Ramazzinians, in highly casual discussions, accomplish more year by year in their exchange of experiences in the estimation of the significance of new developments. Without any records or prospective published proceedings, the easy flow in the exchange of ideas well equips the members of this group to cope with all the newness in the field of industrial medicine and always with emphasis upon occupational disease.

Although not so designated, the Ramazzini Society is the "honor organization" among industrial physicians. Eagerly membership is sought in this invitational group. Somewhat justly, complaints arise that the rigid adherence to the closed membership of 31 physicians is unfair to numbers of industrial physicians who equally might profit by the discussions that develop. The considered judgment of this small group, unmotivated by selfishness, is that any enlarged society soon would be hampered by all of the difficulties and unwieldiness that attend large-scale assemblies. Since this honor society is ruthless in the expulsion of members who do not conform to the requirement of obligatory attendance, it does come about that over the years replacements within come to embrace the majority of the leaders in the field of occupational health.

At the Lake Clear assembly, Dr. Luigi Parmeggiani, of the Clinica del Lavoro, Milan, Italy, was made a member of the overseas section of the society. Three new Ramazzinians will be elected by ballot from among numerous nominations. In due course their names will be announced. The photographs that accompany this item were made by Dr. Harley Krieger, Medical Director, Ford Motor Company, who is the perennial official photographer of the Ramazzinians.

The Ramazzinians in 1953.

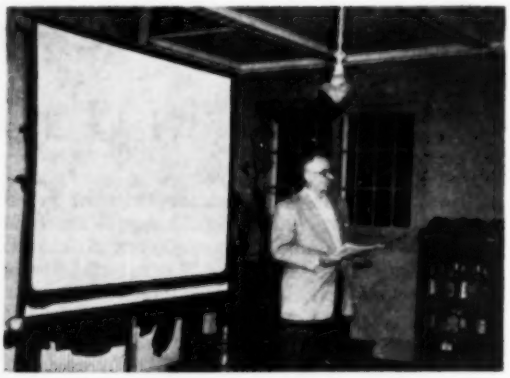
The Managing "Servants"—Drs. James H. Sterner and Lemuel McGee.

Dr. Luigi Parmeggiani (left) of Italy was elected to the Overseas Legion. Others, left to right, Drs. Lemuel McGee, Frank Princi, and Willard Machle.

Drs. Vorwald, Kehoe, and Johnstone—and the problems of beryllosis.

In charge of the 1954 sessions are "Servants," Drs. Willard Machle and George H. Gehrmann.

Over the years the fame of the Italian Bernardino Ramazzini (1633-1714), the Patron Saint of industrial medicine, increases. The name of Ramazzini appears perhaps more often than all other names combined among the historical personages of occupational health. In pride this American group of physicians, the Ramazzini Society, lends itself to the perpetuation of the illustrious qualities of this forerunner in the conservation of the health of workers.



Dr. Elston Belknap delivers the 1953 Ramazzini oration.

The substance of Dr. Belknap's Oration—liberally illuminated with lantern slides, and more interesting in the hearing than can be gathered here—was as follows:

Perspective on Lead Poisoning

OUR PATRON saint, Bernardino Ramazzini, was born in Carpi, in 1633, graduated in medicine in Parma in 1659, and, returning to Modena, near the place of his birth, "he early qualified as a genius by being discredited and maligned by his professional colleagues. This seems to be essential to greatness. Smarting under the barbs of his confreres, he spent much time among the more sympathetic craftsmen of his community. He studied the work of glass makers, painters, dyers, tanners, bakers, millers, stone masons, silk workers, wrestlers, musicians, nurses, porters, grooms, among scores of other trades. As he went about the business of examining workers, he was not content to ask of the patient, 'What uneasiness do you suffer? What was the cause of it? How many days have you been ill? How does your belly stand? What food have you eaten?' But also, and here is what marks him as the sire, 'Of what trade are you?' By 1700, much experience led to his famous book, 'De Morbis Artificum Diatriba,' (The Diseases of Artificers) —the early gospel of the industrial hygienist. In this he noted among many hundreds of other observations that potters daubed molten lead over their vessels before placing them in the furnace, thus to produce a glaze. They thus received by 'Mouth and Nostrils the Lead Particles and are seized with Heavy Disorders. Their Hands begin to shake and tremble, soon become Paralytick, Lethargick, Splenetick, Cachectick and Toothless and in time you will scarce see a Potter who has not a leadened death-like Complexion.'"

This, with some reference also to painters, was part of his not-extensive observations on lead poisoning, to which he devoted only five or six pages in his famous text. Perhaps his rather short references provided an index of the frequency of the occurrence of lead poisoning as compared to

other poisonings at that time. Ramazzini never made a distinction between lead absorption and lead intoxication.

It is possible that lead poisoning may not have been extensive in Ramazzini's time. A contemporary of his in England, Richard Mead (1674-1754), the second holder of the Gold Headed Cane, whose book on Poisons also appeared about 1700 and was regarded as authoritative for many years, never even mentioned lead poisoning, non-occupational or occupational.[1]

Richard Mead, himself, deserves mention. He was not only an early Fellow of the Royal College of Physicians, but he was described in detail by MacMichael, in 1827, as the second of the five distinguished physicians who carried the Gold Headed Cane before it was finally assigned for safety to the Library of the Royal College of Physicians in 1825.[2] The Cane carries the crests of the five owners. At each end of its handle there was a small opening from which one could inhale vapors of various aromatics of supposedly antiseptic value, probably including that of the "Vinegar of the Four Thieves." These vapors would protect the holder from the contagious diseases with which he might come in contact. Osler, who wrote a modern introduction for MacMichael's work, stated that "In many ways the account of Mead is the best in the volume. Of him Johnson is reported to have said that he lived more in the sunshine of life than any man he knew."

IT WAS about 140 years after Ramazzini's time before anyone really described a lead line, and that was done in 1840 by Henry Burton, Fellow of the Royal College of Physicians.[3] Burton stated, "The edges of the gums attached to the necks of two or more teeth of either jaw were distinctly bordered by a narrow leaden-blue line about the one-twentieth part of an inch." An accurate description without the use of the lens, we agree. Actually Burton was describing the result not primarily of the disease of workers but a finding that he noted in a series of patients who had been treated with lead salts for supposed therapeutic purposes.

Differential diagnosis of lead poisoning.

Of modern interest is a photographic record of an actual lead line demonstrated with great skill through a camera lens by Dr. Sanger, of the Dental Research Department of Marquette University. This picture is that of gums belonging to a storage battery worker under my care. He had 40 to 50 stippled cells with no anemia and never developed any symptoms of disability because he was moved to non-lead exposures.[4] A lead line is a sign of lead absorption not of lead poisoning.

After about 60 years, or actually 42 years ago, we find the great clinician, Richard Cabot, of Harvard,[5] repeatedly describing the disease of lead poisoning. He leaned heavily on stippled cells for diagnosis, originally mentioned in 1900 by Hamel in Germany.[6] In fact Cabot was one of the first, if not the first, to point out the unusual relationship between a high hemoglobin and a high stippled cell count as contrasted with many other disease pictures with a low hemoglobin and high stippled cell count. This makes a stippled cell count of unique diagnostic value in lead absorption. As Cabot said in one case study, "Although this case puzzled a number of physicians there would have been no puzzle about it but for the neglect of a routine blood examination, for there is only one disease which often produces basophilic stippling of the red cells in the absence of marked anemia. That disease is chronic lead poisoning."

ON

A REMARKABLE EFFECT UPON THE HUMAN GUMS

PRODUCED BY

THE ABSORPTION OF LEAD.

By HENRY BURTON, M.D.,

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS, AND PHYSICIAN TO ST. THOMAS'S HOSPITAL.

READ JANUARY 14TH, 1840.

No branch of medicine is perhaps of greater importance than that which contemplates the means employed in the prevention and cure of diseases. But notwithstanding a vast number of observations have been made with a view of ascertaining the medicinal efficacy of various substances, and many well-regulated experiments instituted, yet the sum of the information resulting from these inquiries is small in comparison with the labour bestowed in collecting it, and our knowledge of the virtues of medicines still continues very imperfect. Nevertheless, the histories of cinchona, iodine, mercury, and antimony, offer proofs of the benefit which has been already experienced from the discovery of new medicines, and afford a reasonable expectation that ad-

66 DR. HENRY BURTON ON THE

patients, and although it varied a little in point of intensity as well as extent, yet the following description will apply with sufficient accuracy to the majority of cases in which it was remarked. The other phenomena referrible to the state of the mouth, noticed on these patients, were neither peculiar, nor invariably present. The edges of the gums attached to the necks of two or more teeth of either jaw, were distinctly bordered by a narrow leaden-blue line, about the one-twentieth part of an inch in width, whilst the substance of the gum apparently retained its ordinary colour and condition, so far as could be determined by comparing the gums of these patients with those of other patients of the same class in the hospital: there was no invariable tumefaction, softening or tenderness about them; neither was there any peculiar fœtor in the breath, nor increased salivary discharge to be observed on any of the fifty patients; and on thirteen out of fourteen patients, who were treated in the hospital with acetate of lead, and carefully watched during its employment, the substance of the gums, the smell of the breath, as well as the quantity and colour of the saliva, preserved the same characters, after the appearance of the blue line, as they respectively possessed before the saturnine preparation was administered; but on the fourteenth patient, who died from hæmoptysis, the gums, which were, previously to the use of lead, tumid and soft, became contracted and firm, after the blue line had appeared.

IT WAS about 1920 to 1925 when modern automobile production threw us into a chaos of mass lead use and exposure with the manufacture of storage batteries, tetraethyl lead fluid, and the streamlining of automobiles with machine grinding of solder, culminating in the so-called epidemics of lead poisoning. As a result the tempo of interest in research on lead absorption was tremendously speeded up. In 1926 Robert A. Kehoe,[7] who had been studying tetraethyl lead poisoning, began to report his painstaking studies which developed into a really monumental and unequalled research on lead metabolism. Almost at the same time, in 1925, we had Aub's monograph on lead. This made the first clear-cut distinction between lead absorption and lead intoxication, together with the first mention of the clinical use of calcium intravenously for the treatment of lead colic.[8]

DURING the past 25 to 30 years, the use of calcium intravenously has been proved to be the most effective and safe method of treating the symptoms of lead colic. The mechanism of its action has been somewhat disputed but it certainly must be admitted that it is an excellent smooth-muscle relaxant and should rarely be denied any man suffering the agony of lead colic.

In the past four or five years discoveries for the treatment of lead poisoning, particularly in the field of deleading, have developed with increasing speed. These have included the use of BAL, even though this apparently is already outmoded. Here we have the experience, frequent in the field of general medicine, where treatments are quite ephemeral whereas diagnosis standing on more basic priciples is much less subject to change.

More recently the use of calcium-ethylenediamine tetraacetate or calcium EDTA is perhaps now fairly well established as an effective and safe method at least of deleading, if not the actual treatment of the acute episode of lead intoxication in adults.[9] It seems to have had its widest initial usefulness in the field of pediatrics where the greatest number of encephalopathy cases are seen.

UNTIL quite recently there had been a great emphasis on the description of lead poisoning and its three main episodes of colic, palsy, and encephalopathy as of a disease picture already full-blown in spite of Ramazzini's original appeal for prevention. It has been only during the past quarter century that the medical profession has faced up to a modern concept of prevention as its own challenging responsibility in finding means of early discovery and subsequent prevention of occupational disease. A good number of physicians had begun to study the varied types of industrial lead exposure as well as the actual types of clinical lead intoxication. Over the last 30 years a number of names stand out as pioneers in this field. In this country these include Hayhurst, Gray, Hamilton, Hardy, Aub, Smythe, Kehoe, McCord, Johnstone, Mackle, and Legge as well as Ronald Lane of England.[10] Listing these familiar names does not in any way intend to ignore all the other men who have made valuable contributions.

MOST of the sociological and preventive aspects of occupational medicine were already hinted at 250 years ago by Ramazzini when he wrote, "Accordingly I have tried to unearth in the shops of craftsmen, for these shops are schools, whence one can depart with more precise knowledge, whatever may appeal to the taste of investigators, and, which is the main thing, to suggest medical precautions for the prevention and treatment of such diseases as usually affect the worker."[11]

In the field of occupational medicine, as in the field of general or internal medicine, it is obvious that there can be no short-cuts to diagnosis based on any one all important clinical sign or laboratory finding. Each case must be studied individually and as a part of a whole. This is the problem in the clinical and medical control of any occupational poisoning, particularly in dealing with lead poisoning. In any event, as long as we have any failure possible in a machine, in engineering protective devices, or in the human operator of the machine, we would do well always to have available a many-sided medical control correlated with the physician's knowledge of the man's actual working condition.

Though we may still fancy ourselves court physicians, we are frequently brought right back to first principles with Ramazzini when we study, first-hand, the shop conditions of the "man in the pit."

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The Problem of the Aging

From a Report by the Subcommittee on Aging of the Pennsylvania Joint State Government Commission

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Warren, Pennsylvania

IN 1951, the General Assembly of the Commonwealth of Pennsylvania, directed the Joint State Government Commission, its research arm, to study the problems of the aged in Pennsylvania, and report its findings to the Session of 1953. The Joint State Government Commission is made up of 13 members of the House of Representatives appointed by the Speaker; and 13 members of the Senate appointed by its President Pro Tempore. Now as to some disclosures:

Our most important findings: the economic position of Pennsylvania's 887,000 residents 65 years of age and over, who in 1950 constituted 8% of the Commonwealth's population, was lower than that of any other adult group in the community.

In 1949, 21% of our aged male Pennsylvanians had no income whatsoever, and 57% of our aged women found themselves in a comparable position. At this time the median money income of aged men amounted to $1400 annually and for the aged women amounted to $564 a year. In the same period, 23% of the spending units in the United States headed by persons 65 years of age had a net worth of less than $1000, and a money income of less than $2000 per year. This condition has been brought about by a combination of factors which have been operating during the past 60 years as the economy of Pennsylvania has become more and more industrialized, and our population has shifted from the rural to the urban locale. Some of the factors are physical and mental inability to work, limited formal training, restrictive hiring practices, compulsory retirement practices, cyclical unemployment in the 1930's, and the war and the post-war inflation of the 1940's. In 1950 the United States Census found that 25% of the men and women of Pennsylvania, 65 years of age and over, were physically and mentally unable to work.

Geriatrics today is in the position of pediatrics a century ago. This latter medical specialty then was crystallized as a field of special investigation, and important contributions were rapidly made for clearer understanding of the afflictions of children. The mortality rate from the various conditions destroying life in infancy and childhood has dropped in spectacular fashion. Similar successes have been accomplished in the field of epidemiology. All this has resulted in more of our fellow beings attaining maturity and now living into the later years, only to be confronted with the degenerative disorders.

The predominantly self-employed pattern of agricultural enterprises seems to be able to adjust operations with greater facility to workers whose productivity is declining than is the case in the industrial pursuits characterized by an employer-employee relationship. This fact, in the light of the half century change in the economy of Pennsylvania, has worked to the disadvantage of our aged citizens.

In 1950, 68% of Pennsylvania male residents age 65 and over, and 65% of the women of same age, had attended elementary school for eight years or less. Eight percent of the men and 7% of the women of same age group received no formal schooling at all. It must be remembered that an individual 65 years of age today was born in 1888. This meant that the years of formal schooling would have been in the later 1890's. According to the Act of 1879 of the General Assembly, school attendance was required only between the ages of eight and 13. If school was not within two miles of the nearest traveled road available, attendance was not required. In the ensuing half century our formal educational minima have been gradually raised. Our aged citizens have acquired an extensive body of knowledge only through specialized work experience. This fact is generally recognized as long as the aged person has a job, but when such individual is seeking employment, he is confronted with today's standard of formal education which it is difficult for him to meet.

In the period, July to September, 1952, a total of about 93,000 non-agricultural job openings were registered with the Pennsylvania State Employment Service. Of this total, 30% specified no age limits, 4% were open to persons 65 years of age or older, but 66% of these jobs were available to only individuals under 65. There were nearly twice as many of these job openings without age restrictions available for women as for men.

By industry, the percentage of job openings without age restrictions affecting our aged citizens varied from less than 1% for rubber products to 39% for private households.

By occupation, the same percentage ranged from less than 1% in professional positions to 49% in service positions. Thus, the greatest area of opportunity that an aged individual has at the present for employment is in an industry and occupation relatively unattractive salary-wise. Relating these data to the size of the establishment offering the job, it was found that more opportunities for employment without age restrictions were available in establishments employing less than 10 persons than for all larger employers put together. This would seem to indicate that it is the small employer that can make the best adjustment to individuals with declining productivity.

Report on the Investigation conducted by the Subcommittee on Aging of the Joint State Government Commission, as presented by DR. CHAPMAN at Pennsylvania State College before the Annual Health Conference, August 19, 1953. DR. CHAPMAN is Vice-President of the Association of Surgeons of the Pennsylvania Railroad.

Getting into the non-agriculture placement picture during the same period, we found that the Pennsylvania State Employment Service placed 63,000 persons in employment and not even 10%, or 630 persons, were 65 years or over.

This is to be compared with approximately 12,000 individuals in the same age group registered for work with the same agency in September, 1952, and some 31,000 job openings to which age restrictions were not attached. There must have been physical, educational and experiential requirements which our aged job seekers could not meet.

Relating these placement data to industries, it was discovered for the three study months of 1952, no placements of individuals 65 years of age and over were made in forestry, fishing, mining, ordnance, furniture and fixtures, coal, petroleum products, rubber products, or interstate railroads. More placements were made in private households than any other classification. At the same time, more placements were made in service occupations than any other type. Lastly, 40% of the older persons were in establishments employing less than 10 employees.

ONE general conclusion can be safely drawn from both the job opening and job placement information, so far as employers who utilize the facilities of the Pennsylvania State Employment Service are concerned. The relative frequency of both job openings for, and actual placement of, persons 65 years of age and over is lower than the frequency of occurrence of such persons in the labor force. On the assumption that the hiring practices of employers using the Pennsylvania State Employment Service are representative of all Pennsylvania employers, older people must experience long periods of unemployment. This observation is substantiated in part by a special study made in 1950 by the Bureau of Employment Security of the Pennsylvania Department of Labor and Industry. It was found that 48% of the individuals 65 years of age and older had exhausted their unemployment compensation benefits in January, 1951, and were unemployed for 40 or more weeks.

I have mentioned the larger number of job openings and job placements for older people in establishments employing less than 10 employees. In the period for 1948 to 1952, the number of such firms decreased in Pennsylvania by 13%. A continuance of this trend could mean a further decrease in employment opportunities for the aged people in Pennsylvania unless some compensating factors are brought into play.

Another factor contributing to the low economic position of some aged people which I mentioned at the beginning, is compulsory retirement at a fixed chronological age. The last quarter-century has witnessed an extensive development of private industrial retirement plans which, according to a 1949 study of the Pennsylvania Manufacturers Association, show a preference for a fixed retirement age.

The Federal Social Security Act which affects the retirement of about 84% of all gainfully employed Pennsylvanians, encourages retirement at age 65. These plans were designed for the most part in the 1930's when policy was concerned with increased employment opportunities for younger members of the community, but they hardly seem consistent with a period of full employment.

Robert Burton, the famous English clergyman of the 17th Century who wrote the classic "The Anatomy of Melancholy," observed: "Employment, natures physician, is so essential to human happiness that indolence is justly considered the mother of misery." Compulsory retirement at a fixed calendar age treats all workers alike. But all workers are not alike. Some have the intellectual ability to adjust themselves to leisure. Most people, however, are not happy when completely idle. The physiological age of an individual is not synonymous with his chronological age; the reasons for individual variations include heredity, mode of living, accident, and disease. That period of life called old age is actually the time during which the effects of decline in cells, tissues, or organs have progressed to the point where they are visible to the naked eye. Restrictive hiring practices and compulsory retirement at a fixed chronological age are examples of the illogicality and inconsistency of our present attitude toward older people. On the one hand, the people of my Senatorial District have not objected to electing me to the Senate of Pennsylvania since 1930, and I certainly cannot be termed a youngster. On the other hand, we maintain unselective compulsory retirement rules for many workers regardless of fitness or ability. Our techniques of personnel management have not kept pace with our techniques of production.

STILL another factor that seems to have contributed to the precarious financial position of some of our aged Pennsylvanians was the period of prolonged unemployment in the 1930's. Unemployment in Pennsylvania was more widespread than in the United States as a whole. For example, in 1940 the Pennsylvania rate of unemployment was 30% higher than the national rate. Experienced workers, age 55 to 59 seeking work, represented 12% of their age group in the labor force. Persons 68 to 72 in 1953 were in the age group 55 to 59 in 1940. In addition to the great physical and mental strain which such a situation can cause, this enforced idleness necessitated that many individuals utilize prematurely, financial resources they were accumulating for their later years.

Despite the depression of the 30's, some of our presently aged Pennsylvanians were able to accumulate some assets. In a period of inflation the worth of real estate and common stock appreciates at a rate which compensates for the decreasing value of the dollar, but the value of the savings deposits, annuities, life insurance, and bonds depreciates. Between 1940 and 1952, the value of the dollar declined at an annual rate of about 5%. This meant that a $1,000 annuity purchased in 1940 was worth about $529 in 1952. This fact, added to declining productivity, has doubly jeopardized the economic position of many of our aged citizens. Unlike their younger associates who may be able to recoup this loss through increased earnings, such an opportunity is seldom available today to any individual 65 years of age or older.

Since the days of the settlement of this colony, private groups have recognized the insecure position of some aged people. With the increase of such individuals in recent years, government has supplanted private efforts and has attempted directly to lessen this insecurity by a variety of means. To the extent that research in disease control improves physical and mental well-being, it may be said to be aiding aged people. In 1952, a little over a million dollars was spent for the purpose of cancer research in

Pennsylvania, of which 58% was contributed by the Commonwealth and Federal governments. At the same time, a little less than half a million dollars was spent for heart research, 90% coming from the Federal government.

Under current Federal income tax legislation, an individual 65 years of age and over is allowed an exemption of $1200 and a deduction for all medical expenses. A veteran of World Wars I and II or the Korean action, at 65 years of age is entitled to a non-service connected disability pension, if the disability is considered to be 10% disabling. From the point of view of the number of persons affected, old age and survivors insurance is the most compensative of all the programs covering 84% of all employed Pennsylvanians. This program is Federally administered and benefits are financed from employee and employer contributions. At the present time the rate of contributions for both employee and employer is 1.5% of the first $3600 of the employee's annual earnings. Benefits are dependent upon the last earnings in covered employment of persons 65 years of age and over, the primary beneficiary, and legislatively designed survivors or secondary beneficiaries, children, parent, spouse.

A wife 65 years or over is eligible for a benefit payment concurrently with a benefit payment to her husband whose past earnings established eligibility, or as his widow. The wife of a living primary beneficiary is entitled to one-half of the benefit payable to her husband. This entitlement increases to three-fourths upon the death of her husband. If a person 65 to 75 has earnings in covered employment of $75 or more per month, he, as well as his secondary beneficiary, becomes ineligible for benefits. This income limitation does not apply to a person 75 or over.

In 1951, the average monthly benefit payment in Pennsylvania for the primary (old age) beneficiary was $45, and ranged for secondary beneficiaries from $24 to $37. About 280,000, or 73%, of the payments in Pennsylvania were being made to persons age 65 or over.

Congress, when it established this program in 1935, tied the size of the benefit payment to the size of past earnings. Over the period, 1940 to 1952 prices increased by 89%. Benefits were not increased until 1950-1952, the increase ranging from 85 to 150%.

THE second largest program from the point of view of the number of recipients, is old age assistance which is administered and financed jointly from general tax revenue by the Federal government and the Commonwealth of Pennsylvania. To be eligible a person must be 65 years of age or older and have no income or resources in excess of administratively specified amounts—in other words, be in need. In October, 1952, some 68,000 persons in Pennsylvania were receiving this assistance. This represents about 8% of our aged people. The average monthly grant at this time was $43. In 1952, approximately $34,000,000 was spent on this aid, 61% of which was contributed by the Federal government.

In Pennsylvania, the adult blind, meeting certain requirements as to vision and income, are entitled to Blind Pension. In October, 1952, about two-thirds of these pensioners were 65 years of age and over. These pensions ranged from $40 to $50 a month with the average pension being $49. They are financed jointly by the Federal government and the Commonwealth in the case of recipients who meet Federal need requirements, and exclusively by the Commonwealth of Pennsylvania for those who do not. Only Pennsylvania, Missouri, and Nevada make payments available in such manner as precludes complete Federal participation.

In 1952, 198 non-profit homes for the aged maintained primarily by religious, fraternal and social organizations operated in Pennsylvania. Some of the residents of these homes received old age assistance. In addition, for the biennium 1951-1953, the General Assembly appropriated $188,000 directly to 18 of these homes which met the state constitutional requirements of being non-sectarian. A similar institution is Commonwealth owned and operated—the Pennsylvania Soldiers and Sailors Home in Erie. For the same biennium this institution received an appropriation of $425,000.

Under legislation passed in 1931, any person or association operating for profit a home for persons requiring treatment or nursing care by reason of sickness, injury, infirmity, or other disability must be licensed by the State Department of Welfare. In 1952, there were 218 convalescent homes with some 3000 patients, and 103 nursing homes, with approximately 85% of these patients in both institutions being 65 years of age and older. Ninety-eight percent of the patients in nursing homes and 68% of the patients in convalescent homes are paying $100 a month or more for their care. This charge can preclude many patients who need this care from receiving it. This figure is at least $36 more than the maximum old age assistance grant. In an attempt to alleviate this situation the State Board of Public Assistance has ruled that a recipient's income from any source, including the county institution district, in an amount equal to the difference between the maximum assistance grant and the cost of convalescent or nursing care is not to be deducted from the grant.

Pennsylvania has 62 county homes. Nine counties do not maintain any county home, and four counties maintain two homes. In 1951-1952, the county home residents totaled about 13,000 individuals, 3000 of whom were hospitalized patients. Sixty-four percent of the residents were found to be 65 years of age and over. Patients in state mental hospitals who have non-psychotic illnesses may be transferred to county homes; in their behalf the Commonwealth pays $1.25 per day care. The Commission recommends that this state reimbursement be increased to cover cost. Under the 1949 amendment to the Federal Social Security Act, Federal funds are available for old age assistance paid in public medical institutions. The Commission recommends that our state act be amended to permit the granting of old age assistance in county homes. The total cost was estimated to be 4.8 million dollars, of which one million would in likelihood be paid from Federal funds.

We looked into other areas such as housing, rehabilitation and recreation. I shall not elaborate on these subjects as other speakers on this panel are discussing them.

Dr. Edward Bortz, of the Graduate School of Medicine of The University of Pennsylvania, has well summarized our continuing problem: "The society which fosters research to save human lives cannot escape the responsibility for life thus extended. It is for science not only to add years to life, but more important, to add life to years." I am sure this distinguished gentleman and physician was thinking

of science in its broadest sense, embracing our private organizations of production and our system of government which is the great contribution of English speaking peoples to world order.

I HAVE sketched for you the general economic climate prevailing in Pennsylvania relative to our older citizens. Your Federal and state governments have strived valiantly to improve this and will continue to do so as resources permit. I consider local government could assume a much more active role than is presently being evidenced, especially in such areas as recreation, housing and institutional care.

Our industry is going to have to revise its personnel practices as to an increasing aged population. At the same time that we make these adjustments in our corporate capacities, much depends upon the individual. Some people will get older, others will grow older. Those who get older will in all likelihood live a drab and monotonous number of years. Those who grow older will do so aggressively and creatively. What to do with our years is more important than years themselves. Each birthday anniversary should mark the beginning of a new chapter of life, rather than the concluding of one.

(1913 Pennsylvania Avenue, East.)

A Pattern of Sickness

WELL people are well, and sick people are sick. At first glance, this statement seems to be a ridiculous simplification, but it is the essence of a survey of patterns of illness and absenteeism in an industrial population—reported by Plummer and Hinkle in *Annals of Internal Medicine* for July, 1953. These authors had previously shown that a high proportion of absence from work was caused by a small proportion of employees, and that these high absence employees were continuously and frequently sick. A comparison then was made of the medical records of high absence and low absence employees, and composite pictures were drawn, representing each group. Plummer and Hinkle called their composite of the high absence group "H.A."— of the low absence group "L.A." They found that "H.A." and "L.A." contrasted in many personal ways, but most particularly in numbers of illnesses, accidents, and surgical operations. Significant in itself was the fact that the stack of medical records of the high absence group was about eight times as tall as that for the other group. The authors suggested that this finding is not unique for industrial medicine, indeed, that it is duplicated in the experience of almost any practicing physician. They opened their essay with that thought, saying: "It is a fact that the practicing physician spends most of his time taking care of the sick person and, as a result, often knows very little about the well person." A moment's reflection by those of us who have been in private practice should convince us that Plummer and Hinkle are right. A preponderance of our time is occupied by a minority of the people who make up our practices. We too have patients like "H.A." whom we know very well, and patients like "L.A." whom we have trouble remembering because we've seen them so seldom. All of this represents a problem that presses as strongly upon the private practitioner, therefore, as it does upon the specialist in industrial medicine. The problem can be summed up in two questions: (1) What can be done to insure that the "well" (low absence) people are kept well and given their share of medical care? The answer seems comparatively simple—full use of periodic health examinations. This entails special educational efforts directed toward these "well" people because of their natural disinclination to bother the doctor. It also implies the need for a full appreciation by the doctor and by the patient of the periodic examination—its limitations as well as its advantages. (2) What can be done to alter the pattern of lifetime ill health that typified the "sick" (high absence) people? Here there is no simple answer. Plummer and Hinkle emphasized the importance of early recognition of the pattern. Beyond this, they admitted that the management of these patients is difficult. They recommend "proper interviewing and counseling"—"sometimes firm disciplining." They had no suggestions for prevention of the pattern. A workable plan of prevention eventually may be evolved. Certainly the reward for such a plan can be measured materially in millions of dollars—spiritually it is immeasurable.

—*GP*, October, 1953.

Pennsylvania Railroad Medical Department

"TOUR the System, study the present medical set-up, and design a better one." This was the assignment given DR. NORBERT L. ROBERTS when he was appointed Chief Medical Officer of the Pennsylvania Railroad Company at Philadelphia, August 6, 1952. Result: "On September 1, 1953, a complete reorganization of the Medical Department of the Pennsylvania Railroad was undertaken.

"This involves the addition to its medical staff of a number of new well-trained young physicians, several of whom are internists, and the rebuilding and re-equipping of its physical plant in a steady program which will require some time for completion. Rather complete diagnostic units are planned for the major centers of employee population, and smaller units at points of lesser concentration. The theme of the new medical program is to be one of employee health maintenance, and it will encompass thorough preplacement and periodic examinations, a health education program, and the formation of an industrial hygiene section."

The following is adapted from *The Pennsy* (September, 1953):

"At a recent conference of the railroad's physicians at Pennsylvania State College, DR. ROBERTS said that the expanded health program now being set up 'will eventually put the Pennsylvania among the nation's leaders in industrial medicine. The Company is investing several hundred thousand dollars in new facilities, and is expanding its annual medical budget generously. This action comes at a time when railroads generally are trying to reduce costs in order to operate successfully in the face of the competition from other carriers.'

"Discussion of the new program at Penn State occupied the PRR physicians for a full week. Fifty physicians were present, including 12 newly appointed. Several more physicians will be added later. The new selections were made from a list of more than 250 applicants from all parts of the country. 'We've had our pick of an outstanding group,' DR. ROBERTS said. 'The large number and the high caliber of the men applying for these positions is a striking indication of the favorable reception our program has had in the medical profession.'

NEW Medical Centers, provided with the latest in scientific equipment, are planned for strategic points across the System. In places of largest employee concentration—New York, Philadelphia, Harrisburg, Altoona, and Pittsburgh—the Centers will each be staffed by five to seven physicians, plus an adequate number of nurses and technicians. Other places will have smaller establishments, but most will eventually be equipped to make electrocardiograms, x-rays, blood studies, and other laboratory tests. In places where no Medical Center is established because of the small number of employees, the PRR will appoint a leading private practitioner to look after employees' needs. In addition, recognized experts in every one of the medical specialities will be retained for consultation with the PRR's physicians.

"'We will do three kinds of work,' DR. ROBERTS told the Penn State gathering. "'First will be preventive medicine—making sure the employees have a healthy working environment, and giving medical examinations to job applicants to be certain they don't have physical defects or diseases that might constitute a hazard to themselves or others.

"'Second will be constructive medicine—helping employees to better health by providing education in diet and similar subjects, by giving periodic physical examinations to those upon whose health and alertness the safety of others depends, and, importantly, by offering similar examinations to other employees who want them. If any defect or disease is uncovered, the employee will be referred to his own doctor for treatment. Our big contribution will be helping the employee to find any trouble early when there is the best chance of its correction or cure.

"'Our third kind of work will be dispensary medicine—giving first aid in accidents. Of course, we don't intend in any way to take the place of the employee's family physician.

"'The skill, knowledge and strength of employees is an employer's greatest asset, and a company is only showing common wisdom in doing everything it can to help its employees lead long, healthy, productive lives. On the Railroad, we have M.W. and M.E.—Maintenance of Way Department and Maintenance of Equipment Department. Eventually, I hope to hear our medical staff called M.H.—Maintenance of Health—as one of the essential operating departments of the PRR.'

IN DR. ROBERTS' study he found one of the main needs of the existing arrangements to be a central organization. The medical system had grown up over the years in unrelated segments. The PRR Voluntary Relief Department had a staff of doctors working full-time who not only gave physical examinations to its membership but also to PRR job applicants and those em-

ployees required to have periodic check-ups. Each Division had surgeons on a retainer or fee basis. Lastly, there were part-time consultants who gave periodic examinations to Company officers required to have them.

"Under the new system, the medical service is set up like other operating departments. At the head is the Medical Director, on the staff of the Vice-President—Operation. Each Region has a Regional Medical Officer reporting to the General Manager; and each Division has a Division Med-Manager; Altoona has a Works Medical Officer reporting to the Works Manager; and each Division has a Division Medical Officer reporting to the Superintendent and directing all the Division's physicians.

DR. ROBERTS, 37, came to the Railroad with an established reputation in industrial medicine. "He is a big (6 feet 4) quick-moving, decisive man, who was brought up in Buffalo, New York, and graduated from the University of Buffalo Medical School in 1940. Following his internship, he was a resident in pathology at Buffalo General Hospital, and then a resident in medicine at the Millard Fillmore Hospital, also in Buffalo. In 1942, he joined the Army as a flight surgeon—he had been an amateur pilot—and served until 1946, mostly in the European Theater. He then spent three years at the Mayo Foundation on a Fellowship in internal medicine. He received a Master of Science degree from the University of Minnesota in 1949, and was certified a specialist by the American Board of Internal Medicine in 1950. For three years prior to joining the PRR, he helped the Standard Oil Company (New Jersey) organize employee health services in seven European countries."

THE FULL-TIME physicians appointed by DR. ROBERTS to the new Medical Department, with their titles and locations, are:

ADAMS, A. M., Medical Officer, Erie, Pennsylvania.

ASBURY, C. W., Central Regional Medical Officer, Pittsburgh.

AYE, WALTER, Chicago Divisional Medical Officer, Chicago.

AYERLE, R. S., Medical Officer, New York.

BISHOP, D. W., Medical Officer (Internist), Altoona, Pennsylvania.

BLACK, IRVIN, Columbus Divisional Medical Officer, Columbus, Ohio.

BOONE, L. J., Eastern Divisional Medical Officer, Pittsburgh.

BREWSTER, J. M., Medical Officer, Philadelphia.

BROPHEY, BERNARD, F., Medical Officer, Altoona, Pennsylvania.

BROWN, H. G., Cincinnati Divisional Medical Officer, Cincinnati.

CERCHIONE, A. G., New York Divisional Medical Officer, New York.

CRAIG, F. B., Medical Officer, Pitcairn, Pennsylvania.

CURRAN, P. H., Medical Officer (Internist), New York.

DAY, T. P., Lake Divisional Medical Officer, Cleveland.

DENNING, P. P., Middle Divisional Medical Officer, Altoona, Pennsylvania.

DOWNS, R. I., Medical Officer, Camden, New Jersey.

EHMANN, F. H., Medical Officer, Philadelphia.

FERNANDEZ, R. O., Medical Officer, Wilmington Shops, Delaware.

FINE, N. J., Altoona Works Medical Officer, Altoona, Pennsylvania.

FORTESCUE, T. A., Medical Officer, Trenton, New Jersey.

GERSTLE, W. J., Northern Divisional Medical Officer, Buffalo.

GLENN, D. L., Eastern Regional Medical Officer, Philadelphia.

GORISSE, G. A., Medical Officer, Pittsburgh.

HAMILTON, E. D., Ft. Wayne Divisional Medical Officer, Ft. Wayne, Indiana.

HAMILTON, H. B., Philadelphia Term. Divisional Medical Officer, Philadelphia.

HARTLEY, C. H., Philadelphia Divisional Medical Officer, Harrisburg, Pennsylvania.

HURSH, A. M. W., Assistant Medical Director, Philadelphia.

KELL, R. C., Neuropsychiatrist, Philadelphia.

KELLY, E. B., Medical Officer, Washington, D.C.

KNADLER, G. W., Medical Officer, Philadelphia.

KOBER, W. H., Medical Officer, Elmira, New York.

KOEPF, F. W., Medical Officer, Columbus.

MCNAMARA, ALEXANDER, Medical Officer, Altoona, Pennsylvania.

MANISCALCO, F. X., Medical Officer, New York.

MORIARTY, LOUIS, Medical Officer, Grand Rapids, Michigan.

NUNEZ, O. E., Medical Officer, Logansport, Indiana.

O'DONNELL, H. G., Susquehanna Divisional Medical Officer, Williamsport, Pennsylvania.

PERRY, J. H., Medical Officer, Pittsburgh.

PHILLIPS, H. L., Medical Officer, Washington, D.C.

RAVETZ, ELKIN, Medical Officer, Philadelphia.

SAUL, R. D., Pittsburgh Divisional Medical Officer, Pittsburgh.

SHILLOTT, C. J., Medical Officer, Harrisburg, Pennsylvania.

SILVERS, R. T., Medical Officer, Canton, Ohio.

SINDLER, JOSEPH, Maryland Divisional Medical Officer, Baltimore, Maryland.

SPITALERI, L. N., Medical Officer, New York.

STENGEL, ALFRED, JR., Medical Officer (Internist), New York.

SYCZ, ENHEW, Medical Officer, Cleveland.

WALTIER, R. H., Medical Officer, New York.

WILKINSON, W. W., Medical Officer, New Castle, Pennsylvania.

WOLF, HERMAN, Medical Officer, Wilmington Passenger Station, Wilmington, Delaware.

WOODWARD, W. W., Medical Officer (Internist), Philadelphia.

President's Page

IN JUNE, 1945, by execution of a trust agreement, the American Foundation of Occupational Health was established by the Industrial Medical Association. The Foundation was conceived as an instrument "to improve the teaching of industrial medicine and occupational health in medical schools and schools of public health, and to conduct studies and surveys of facilities and educational programs in medical fields as applied to industry, as well as to obtain funds for the sponsorship of medical residencies and postgraduate training in industrial medicine."

Also in 1945, efforts were being made toward the creation of an American Board of Occupational Medicine. One fundamental objection to specialty board status at that time was the absence of a formal program for postgraduate training in occupational medicine. Therefore it was quite natural that the newly created Foundation should concentrate its initial efforts on this particular problem. Members of the Industrial Medical Association were approached and by means of individual contributions, the sum of five thousand dollars was raised. With this amount, the Foundation was able to grant a Fellowship to a carefully selected young physician, enabling him to enroll in a formal three-year postgraduate training program in industrial medicine at the University of Pittsburgh.

In March, 1949, the Commissioner of Internal Revenue ruled the Foundation to be a trust, organized and operated exclusively for educational purposes. This was important from the point of fund raising for it established that contributions to the Foundation are deductible from the Federal income tax returns of the donors.

In 1950, the Foundation was offered the opportunity of taking over the program of evaluation and certification of medical services in industry, this being the program that had been conducted so successfully by the American College of Surgeons since 1932. The then Trustees of the Foundation were fully cognizant of the excellent educational opportunities offered by such an activity. Accordingly the Foundation entered into negotiations with the American College of Surgeons and transfer of the medical services in industry program was accomplished in May, 1951.

During the ensuing year the modest operation of this program was made possible through the financial support of the steel industry. However the Trustees were convinced that the Foundation's activities are worthy of the support of industry in general, preferably through many relatively small contributions from all types of industry rather than by means of large contributions from a few specific industries. The Trustees also were aware of the fact that much more substantial financial support would be needed if the Foundation were to accomplish all of its objectives. Accordingly a fund raising program was developed in line with these considerations. In June, 1953, some 7200 industries and approximately 80 foundations were approached. To date the response from industry has been most heartening. As a result of the approach to the many large charitable and educational foundations, some constructive suggestions have been received. It has been pointed out that the title "American Foundation of Occupational Health" is entirely proper if its funds are to be supplied by the membership of the Industrial Medical Association. However it further has been pointed out that the term "Foundation" implies a trust with money at hand to distribute for worthy purposes, rather than a trust that itself must solicit funds from outside sources. And, finally, it has been emphasized that it is somewhat incongruous for one foundation to approach another foundation for financial support.

Several large foundations also suggested that the Trustees give consideration to a possible reorganization of the structure of the American Foundation of Occupational Health. In this connection it was pointed out that trusts managed exclusively by professional individuals, as a rule are notoriously unsuccessful in reaching their objectives so far as fund raising is concerned, and several historical precedents were cited to substantiate such opinion. It was suggested that a reorganization of the administrative structure of the American Foundation of Occupational Health to afford representation by non-professional as well as professional individuals, each with voting power, would go far toward insuring the success of fund raising activities in the years to come.

After long and careful study of these suggestions, the Trustees of the Foundation believe that some type of reorganization is desirable if the Foundation is to enjoy a continuous and firm financial structure. At recent meetings, these views were presented to the Advisory Board of the Foundation and to the Board of Directors of the Industrial Medical Association. Both of these bodies were in agreement and have encouraged the Trustees to proceed to bring about certain changes in the present structure of the American Foundation of Occupational Health.

George F. Wilkins M.D.

ON BEHALF of the Association's Officers and Directors, may I express to all fellows, members and friends of the Industrial Medical Association our sincere wishes for a Joyous Christmas and a Happy and Prosperous 1954.

The rapid growth of our Association in recent years has served to impose constantly increasing responsibilities upon those charged with the administration of its affairs. However, with a strong and expanding membership contributing active interest and support, it is certain that our Association will continue to grow and to exert an ever greater influence upon all phases of industrial medicine and occupational health in the years ahead.

George F. Wilkins M.D.

President, Industrial Medical Association

Association News

INDUSTRIAL MEDICAL ASSOCIATION officers and directors met in Chicago, at a four-day session, October 16-19, 1953. Friday, October 16, was given over to a meeting of the Board of Trustees of the American Foundation of Occupational Health, and, in the afternoon and evening, a meeting of the Advisory Board of the Foundation. The IMA Executive Committee meeting occupied all of Saturday, October 17, and a meeting of the IMA Board of Directors the following day began at 10:00 A.M. and continued until 5:30 P.M. On Monday, October 19, the representatives of the six participating groups held a planning session for the 1954 Industrial Health Conference at Hotel Sherman, Chicago, April 24-30. The Board of Directors elected 41 new members; elevated 56 Associates to active membership; and approved the applications of 20 members for Fellowships to be conferred at the Annual Meeting in April.

STEPHEN G. HALOS, Director of Exhibits for the INDUSTRIAL HEALTH CONFERENCE and the AMERICAN ASSOCIATION OF RAILWAY SURGEONS, reports that reservations for exhibit spaces at the Annual Meetings of both organizations are coming in so fast that only a few remaining booths are available for either meeting. The AMERICAN ASSOCIATION OF RAILWAY SURGEONS meeting will be held April 6-8, at the Drake Hotel in Chicago. The INDUSTRIAL HEALTH CONFERENCE will be held April 24-30, at the Sherman Hotel in Chicago. Among those arranging for exhibit space are many companies that will be exhibiting in the Industrial Medical Market for the first time—this in addition to the regular exhibitors. It is strongly urged upon all who attend either of these meetings to make it a "must" to visit all the exhibits, with an interest in the many important products displayed. No small part of the success of these meetings is due to the exhibitors. They will consider themselves repaid if all those in attendance visit them at their booths—*and register.*

Instrumentation in Industrial Hygiene

INSTITUTE of Industrial Health and School of Public Health, University of Michigan, announce a Symposium on Instrumentation in Industrial Hygiene, to be held May 24-27, 1954, at Rackham Building, Ann Arbor. There will be exhibits, discussions and technical papers with the purpose of showing what is available and what is needed in connection with such industrial hygiene problems as air velocity, air pollution, ionizing radiation, noise, air sampling and analysis. The Symposium is designed to bring together instrument makers and users; to acquaint users with instrument sizes, applications, and performance; to inform users on technical data, including limits of accuracy, maintenance, and interfering conditions; to exchange information and ideas on equipment; to outline needs for improvement, and for development of new instruments; and to exhibit "homemade" devices so that these may have wider usefulness. The program will include exhibits, discussions, and technical papers on instrumentation in the following areas: sampling and analyzing air contaminants; laboratory type instruments for industrial hygiene; atmospheric pollution evaluation; measuring air velocity and metering air; measuring sound and vibration; measuring ionizing radiations; measuring physical phenomena—light, etc., and home-assembled instruments. Papers presented at the Symposium will be published in an illustrated book, which will include technical data supplied by the instrument makers. The cooperating organizations are Scientific Apparatus Makers Association; American Industrial Hygiene Association; American Conference of Governmental Industrial Hygienists; University of Michigan, School of Public Health, Institute of Industrial Health. Further information may be obtained from HARRY E. MILLER, Director of Continued Education, School of Public Health, University of Michigan 109 S. Observatory St., Ann Arbor, Michigan.

Science Miniature

Titanium Metal Fume Fever

CAREY P. McCORD, M.D.

TITANIUM and its most widely applied derivative, titanium dioxide, long have been credited with being almost entirely innocuous. It is true that the term "titaniosis" has appeared, designating a mild, dusty lung disease. The original work has not been verified and, should the condition exist at all, probably it is not other than a benign pneumoconiosis.

Some of the salts of titanium, such as the oxalate and the dichloride, are injurious but quite apart from the titanium itself.

The significant peril attending metallic titanium relates to titanium fires and explosions, the danger probably equalling that from magnesium or aluminum dust.

Since the recent advent of metallic titanium into industry, scattered complaints have appeared among workers alleging nausea, headaches and malaise. It is deemed prospective that a titanium metal fume fever does occur and that the expectable manifestations would be similar to those from zinc or magnesium metal fume fever. However, the occurrence on occasion of increased eosinophile numbers suggests the possibility of sensitization. The fact that the affection arises solely or chiefly around highly heated molten titanium, favors the metal fume fever concept.

Letters

Weil's Disease

TO THE EDITOR: I have just read with interest your editorial on Weil's disease in the September, 1953, issue of *Industrial Medicine and Surgery*. I want you to know that one Fellow of the Industrial Medical Association has not neglected this disease. There may be some interest in two publications by me on this topic now cited:

"Weil's Disease: Observations in Sixty-One Cases, with Special Reference to the Use of Penicillin in Six Cases." H. M. PATTERSON, *J.A.M.A.*, 134: 1077 (July 26) 1947.

"Weil's Disease: A Report of Thirty-Seven Cases." H. M. PATTERSON, *Hawaii Medical Journal* (May-June) 1944.

I certainly agree with you that "In the United States one neglected occupational affection is 'Weil's disease.'"

I believe the recommendations in my articles for early recognition and the most effective treatment for Weil's disease are sound, and I hope they will be considered when this disease is under study. I feel that the key to the approach to a study of Weil's disease is to be suspcious of it. Most cases of Weil's disease reported in the American literature are very severe ones with a high percentage of deaths. These severe cases are fortunately not seen often in the lifetime of even the busiest physicians. The less severe case of Weil's disease is easily confused with other diseases, and, even if Weil's disease is thought of, the laboratory work essential for the diagnosis is usually not available, or is not done, or if done early is not repeated at a time when it would make the diagnosis certain.

—H. MCLEOD PATTERSON, M.D., F.A.C.S.
202 King Kalakaua Building
Honolulu 14, T.H.

Books

Atlas

RADIOLOGICAL ATLAS OF THE PNEUMOCONIOSES: OTTO ZORN, Chief Physician, Medical Clinic Bergmannsheil Hospitals, Bochum; and GUNTHER WORTH, Chief Physician, Medical Clinic Bethanien Hospital, Mors. Koln, Staufenverlage; p. 303, $16.50.

Otto Zorn, head of the medical clinic of the "Bergmannsheil" hospitals of the Miners Health Association in Bochum, and Guenther Worth, head of the medical clinic of the "Bethanien" hospital in Moers, both disciples of Professor Reichmann-Bochum, dedicated this book to him on his seventieth birthday. I cannot imagine any scientist—and Reichmann was and is one of the pioneers in the study of dust diseases in Germany—receiving a more precious dedication.

Examining the literature on dust disease, we find that since the South African scientist undertook the first modern dust lung research with x-ray, in 1912, a tremendous number of publications on the subject have appeared. In the middle thirties one American review arrived at a total of 2700. But each of these papers discusses one particular problem, one type of dust or occupation. Of more comprehensive writing I find only two examples (L. Lochtkemper: Atlas der Staublungenkrankheiten—Atlas of Dust Lung Diseases, *Arch. f. Gewerbepath.*, Vol. 3, 1932; and A. J. Amor: An X-Ray Atlas of Silicosis, London, 1943). This is understandable, since an atlas of this kind, treating of all types of dusty lungs, can be produced only by men with an immense amount of material of their own and with connections which make accessible to them material from other sources.

This Atlas offers an x-ray lung picture, in half life-size, on almost every second page. In addition we get full-size pictures of special parts of the lung, tomographies, angiographies. The whole text appears in three languages—the German of the authors; a literal translation into French by E. Balgairies, Chief Physician of a French coal basin; and an English version by C. M. Fletscher, of the Pneumoconiosis Research Unit in South Wales. The latter also grades the diseases in accordance with the new international classification. The pictures are for the most part from the authors' own collection, but some were contributed by a Swiss scientist; these show acute silicosis among sappers. Others come from the Research Unit in Cardiff, from the South African Silicosis Medical Bureau, from our own Cleveland, Ohio (berryllium), etc.

Thus we are given x-ray pictures and case histories of all occupations and covering all kinds and phases of dusty lungs. There are of course the typical pneumoconioses, in their various stages, from the Ruhr and South Wales; then atypical forms:

eggshells, atypical subpleural silicosis, coal miner's lung with "rainstorm" streaking in the lower zones, perivascular silicosis. There is the picture history of a Swiss sapper: first "exceptionally fine-grained marbling," then without further exposition, two years later, silicosis III with marked pleural thickening and massive fibrosis in the lower lobes. There follow pictures from various industries: a fluorite miner, barita lungs in different stages, talcum lungs, carborundum lungs, siderosis, aluminum lungs, etc.

The last chapter offers pictures and histories of lung diseases "producing radiographic changes that are almost indistinguishable from those of pneumoconiosis." There are the honeycomb lungs of a 22 year old boatman, of a 36 year old coalheaver, a Boeck's sarcoidosis, a cystercosis, small and large lungstones.

We cannot enumerate all the interesting pictures, but we must mention the chapter on "Special Methods of Investigation." Here we have horizontal and transverse tomographies, bronchiographies, angiocardiographies. We wish only to add that all the x-ray pictures are excellently made and reproduced, and that where the authors deem it helpful they have included special areas in life size (in addition to the half-size lung picture). To every picture is attached a case history, a description of the picture, sometimes a later picture of the same case, and autopsy findings. All the verbal explanations are written as stated above, in German, French, and English.

—L. TELEKY, M.D.

Preventive Medicine

TEXTBOOK OF PREVENTIVE MEDICINE: H. R. LEAVELL and E. G. CLARK. McGraw-Hill Book Company, New York, 1953, pp. 629, $8.00.

This is a textbook which is directed primarily toward the development of a point of view, a philosophy, and a method of approach to the problems of preventive medicine. It is a book which has been designed specifically for the undergraduate medical student, but it should be of interest to all practitioners regardless of their specialty. Throughout the various chapters the epidemiologic approach to preventive medicine has been stressed and its meaning in specific instances is defined.

Although only one chapter deals with occupational health itself, the general philosophy of this book should be applicable to specific problems of industrial medicine. In this chapter no attempt is made to deal with all the problems which confront the industrial physician. Instead, the field of occupational health is defined, certain broad principles are explained, and an effort has been made to describe the needs and problems of this special field.

In general, this seems to be an excellent book for orientation of the medical student in the fundamentals of preventive medicine, and should prove of value to any physician so that he may be able to work effectively with the official health agencies of his community.

—FRANK PRINCI, M.D.

The Microscope

THE INTELLIGENT USE OF THE MICROSCOPE: C. W. OLLIVER. Chemical Publishing Co., Inc., New York, 1953, pp. 192, $4.00.

A current medical periodical recently has published the hobbies of a long list of named physicians. Some have gone in for philately, lapidary, sailing, golf, chess, etc., but no mention was found as to microscopy as a physician's hobby. Apparently student years deprived most physicians other than the bacteriologist and the pathologist of all affection for the microscope. And yet, the majority of physicians have in their offices or homes an almost forgotten instrument available for hobby occupation and apart from any professional use. Many persons over the land continually are grieved that no longer to them are there any frontiers inviting exploration. Just the contrary is true. There are unlimited frontiers to be explored pleasurably through such things as the microscope and the telescope.

Intrigued by the title of this book, it is observed that one intelligent use of the microscope is in the furthering of hobbies.

None of the foregoing appears in this book. The enthusiastic author lends his experience to the technical aspects of the microscope—to illuminating systems, the limits of resolution, lens systems, measurements and counts, phase contrast mocroscope and photomicrography—mostly with his eye on students. The author reveals the microscope to the user. Few medical students and few physicians frequently making use of the microscope have any real understanding of the physics involved in microscopy.

Back now to the hobby idea. Get out that old tarnished microscope. Renew the acquaintance. This book will serve the friendship.

"The Meaning of Health"

THE EPIDEMIOLOGY OF HEALTH: A New York Academy of Medicine Book: IAGO GALDSTON, M.D., (Editor). Health Education Council, New York, 1953, pp. 197, $4.00.

The title of this book is startling! The concept of an "epidemiology of health" is brilliant. The exposition is fluent. Formerly epidemiology was precisely related to mass disease interpreted on the basis of all factors involved, including those of the host, the agent of disease, and the total environment. Presently the term "epidemiology" has been accorded such broadening that almost it is synonymous with "public health" itself. By some, even further broadening has been accomplished, reaching beyond all diseases. Thus conceivably there might be the "epidemiology of shooting stars." With'n that unboundaried definition, the entire content of this book becomes admirable epidemiology. The pattern of this newer concept of health was fashioned by the editor in Chapter I and given three-dimensions by the three chapters contributed by DR. JOHN GORDON, the youthful "old master" in epidemiology. Other members of this epidemiologic team extended this new concept into the history of health, into the health of the army, into industry, tuberculosis, mental hygiene, nutrition, old age, and health education. Of particular appeal to this Journal is that section on "The Epidemiology of Health in Industry" by DR. LEO PRICE.

This book is based on the Eleventh Annual Eastern States Health Education Conference. The term, "epidemiology of health," emerged from that conference. Had that term not asserted itself, the entire contents of this book might have been revealed in the title, "The Meaning of Health," which nearly is the caption for the chapter contributed by HAVEN EMERSON. One of the qualities found in this book is that it has not pre-empted the opportunities to contemplate health in terms of epidemiology. Unfailingly this conception has arrived to stay. Not for a long while will the occasions for supplementation become exhausted.

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Industrial Medicine's Golden Age

PROPHECY is a miserable art. The favorite at a horse race is not picked by sheer prophecy but by the record of past performance. Even so, the favorite does not always win. The economists who predict a year of prosperity just ahead, rest their case on an array of charts, curves, and tables. They, too, are far from infallible. Guided by past performance and trends, but possibly still only in brashness, there may be warrant to whisper but not to shout that occupational health now is entering upon its golden period. What so augurs? There are the signs and omens?

There was something conclusive in this year's Los Angeles sessions, and not necessarily limited to the scientific program. When a group of five scientific bodies convenes in a comparatively far removed city and still brings together more than 1600 registered and unregistered participants, with some from as far away as Nova Scotia on the East and the Hawaiian Islands on the West, then that Conference may be labeled as sturdy, and all concerned may rest assured that occupational health now is in the big league. That is one augury.

Certification for limited numbers of industrial physicians could be just around the corner. When that corner is turned another omen will appear. Occupational health long has been subjected to a position apart from midstream because of lack of facilities for specialty education. All that has disappeared. Educational opportunities of sound character presently exceed the demand on the part of trainees. That bodes well, however regrettable the absence of a full complement of students. The signs are in; the red ball is up.

The golden age for any art or science does not arrive when the last good painting has been signed by its creator, or when "finis" has been written by the poet, or when the musician signs off with his coda. Golden ages may not be recognized until they are over, but their actuality exists only during the period of stirring, the time of creation, the years of production, the period of striving. Lafcadio Hearn perhaps started the golden age of literature that became the fortunate lot of the Mississippi Valley. Decades later Hearn died an expatriate in Japan, little aware that it was he that smelted the ore of the mid-west's golden age.

Fortunate is that group that may be made aware of its golden age during the time that its gold gleams. Every nugget adds to the striving; every reflection from its brightening surface provides impetus for further brightness. Never does any golden age mark finality. In truth, when all is accomplished, the golden age is over, the sheen dims, the struggle ends. The true golden age is the period of fever, the long reaching, the far planning, the wistful hoping culminating in action.

For occupational health the golden age has started. Now, as 1953 goes out to the Gate "where the Great Accountant sits," only the left-hand bracket, the one that marks the beginning, is visible. How long it shall last, how long before the time when the right-hand bracket shall mark its end, no man can say. That would call for prophecy, and prophecy is a miserable art.

Labor Union Health Centers

ONE of the notable developments of the day is the rise of the union health centers. While these enterprises may not represent pure industrial medicine, obviously they are accepted as

such since an outstanding union medical leader has ably served on the Board of Directors of the Industrial Medical Association and, in this Journal's recent Anniversary Issue, one of the striking features described a union health enterprise. During the past score of years those most concerned in the orderly development of industrial medicine have urged upon labor unions the health conservation of their members as one of their notable opportunities for accomplishment.

Now that much has been achieved and more is in prospect, it appears that something is missing—something is lacking in the provisions. Long it has been maintained that the health of workers, insofar as it is influenced by the work itself and the work environment, is a function of management. In the midst of the present time of union health centers, management may be inclined toward less emphasis on the maintenance of in-plant medical services. Directly or indirectly management contributes to, or supports, the union health centers. Why in addition should it be concerned with additional in-plant facilities?

THE answer to this rhetorical question is the "work environment." Never may it be believed that any large work environment ever is free of harmful potentialities. In the garment industry the work requirements are highly dissimilar to those associated with the usual forms of heavy manufacturing in which machinery is everywhere in operation. Still in the garment industry are those potential threats concerned with illumination, seating, noise, over- or under-heating—and these items are but examples.

At no point in this editorial, or at any time in this Journal, may any condemnation of union health centers be found, nor are grounds afforded even for condemnatory surmises. Yet with possible exception it may appear that when both management and the labor union are viewing with pride and satisfaction a union health center located with some degree of remoteness to the work plant, both management and the union group may be overlooking the work environment. The well established dictum that no large work environment inherently is free from damaging work exposures, applies only in lesser degree to the garment factory than to the steel mill or the the tannery.

So comes the large question: What becomes of that portion of a good program of occupational health, industrial hygiene, when all major health activities are located in the far away health center?

Autumn Slaughter

THE FIRST American silo was built by Dr. Manley Miles in 1875. At least as early as 1900 it was well established by Babcock and Russell, in the Annual Report of the Wisconsin Agricultural Experimental Station, that the products of fermentation within the silo during and shortly after filling include high volumes of carbon dioxide. Since that time, scores of other reports from sources close to agriculture and dairying have warned that the silo at this season of its filling is a veritable lethal chamber. One of the best accounts was that written by Hayhurst and Scott in *J.A.M.A.* in 1914 (63:1570). This publication puts on record four simultaneous sudden deaths in a silo at the Athens, Ohio, State Hospital.

Still, year by year, decade by decade, deaths occur. Never is the number large, but the regularity is appalling. Most astonishing but always revealing are letters from inquiring physicians who in deep perplexity make inquiries as to what possibly could have happened leading to the quick death of a hale young farmer doing nothing more than the tramping down of ensilage in a silo. The answer is simple. In the shredded cornstalk, with its fodder and corn, the carbohydrate content undergoes rapid atmospheric oxidation. The oxygen in any confined space speedily is consumed. Bacterial action provides fermentation. Carbon dioxide is evolved. It is not unusual for the percentage of carbon dioxide to reach 38, when the usual atmospheric content of carbon dioxide approximates 0.2%. By best definition carbon dioxide is not a poison. The victim rapidly succumbs to oxygen deficiency. The normal oxygen content of the air is depleted in the chemical reaction but the situation is compounded by the production of the carbon dioxide. The victims quickly and insidiously are asphyxiated.

Opportunities for prevention are numerous and some are simple. One of the simple ones involves the architecture of the silo itself. If workers are to be required to pack down ensilage every silo should be so constructed as to possess multiple hatchways or doors that provide openness up to the successive levels at which the work is performed. Better still, and perhaps in addition to the foregoing, a blower with suitable piping should operate at all times when workers are present inside the silo so that respirable air may be supplied.

The silage season of 1953 already has taken its toll. A new crop of victims will appear in 1954. All these deaths are unnecessary, inexcusable, and but represent human wastage.

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News, Comment, Opinion

IT HAS BEEN reported that government, industry and philanthropists are spending more than $181,000,000 for medical research in 1953, or 10 times the amount spent for that purpose in 1941. This is a healthy increase, but we still spend over $185,000,000 per year for monuments and tombstones."

—HARRY J. LOYND, President, Parke, Davis & Company, addressing the American Pharmaceutical Association, August 20, 1953.

Workers' Wants

AT PHILADELPHIA'S Provident Insurance Company, a survey uncovered this lurking employee wish: A greater choice of desserts at the company's cafeteria. In Bartlesville, Oklahoma, Phillips Petroleum workers put it this way: Let's have more longhair music and less jazz over the plant's wired music system.

—*Wall Street Journal*, October 29, 1953.

That Old Black Magic

AN EASTERN manufacturing company which made an attitude survey among its employees found that women working next to men had the highest morale in the plant while the same men had the lowest. This intimation that the rooster may be an unhappy bird has the company so puzzled it doesn't want to talk about the survey, except anonymously, until it figures out what it all means.

—*Modern Industry*, 25:3; in *Management Review*, October, 1953.

New Medical Program

GOODYEAR Atomic Corporation, Portsmouth, Ohio, has been selected as the operating company for the new Atomic Energy Gaseous Diffusion Plant in Pike County, in the southern part of the state. The Company is planning a complete industrial medical program, including industrial hygiene, and has already designed a modern industrial hospital.

Special Interest Clubs

TODAY'S worker doesn't live by money alone. B. F. Goodrich probably has more special interest clubs than any other company of its size in the world. Here the stamp collector need not go his lonely way looking for a sympathetic soul who will share his joy with a rare Portugese commemorative issue of 1912. Instead, he forms a club with other philatelists and thus adds another organization to the list of bridge players, weavers, amateur cabinet makers, bird watchers, and chamber music enthusiasts already in existence. Do you like to bowl? The company has its own alleys. Is golf to your taste? It operates the largest industrial golf tournament in existence.

—From "John Lyon Collyer," a Biograph, in *National Biographic*, published by American Institute of Management.

Turnover

HIGH COST of turnover is indicated by figures from one company which hired 28,000 factory workers for a net gain of 5,156. This firm estimates the cost of putting an hourly worker on the payroll at $208, making the total cost for the 22,000-odd lost $4.5 million. In the case of an engineer, another personnel manager estimates, the initial cost is $788, and may be as much as $7,000-$8,000 more in salary before the company really begins to benefit.

—*Personnel Executives' Newsletter* (Deutsch & Shea), October 15, 1953.

Old Timers Play It Safe

LENGTH of service and safety appear to go hand in hand. When the Ford Motor Company analyzed its accident records it discovered that most mishaps involve new employees. Here are the figures:

Years of Service	Percentage of all Accidents
0-1	46.5
1-5	23.2
5-10	12.3
10-15	5.4
15-20	4.4
20 years and over	8.2

The company found that intensive safety training of newcomers helped to cut down their high accident rates.

—*Employee Relations Bulletin* (National Foreman's Institute), in *Management Review*, August, 1953.

Liaison

THERE is an increasing cooperation between the medical schools and American business. The deans of the schools and the directors of some of the large corporations are planning regional meetings to discuss the training of industrial physicians by the schools and industrial aid to

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POSITIONS WANTED

Medical Director: (201) Graduate Class A medical school; eight years, private general practice and part-time Medical Director, large steel company; five years, Medical Director, major company, (70,000 employees); full charge entire medical program including all policies for 35 regional plants; fully qualified all phases industrial medicine; can recommend without any reservations.

Medical Director: (202) 34; B.S., M.D. Emory University Medical; Masters, P.H. (major, industrial medicine and hygiene, Johns Hopkins) four years, surgeon, major steel company hospital, 40,000 employees; seven years, Chief, industrial medicine and occupational health; numerous publications industrial medicine.

Medical Director: (203) Assistant or Associate; B.S., M.D., Loyola University, Medical; 12 years, successful private general and surgical practice; five years, staff physician, large State college; late forties.

Staff Physician: (204) 32; four years Air Force officer; M.D. degree, George Washington, Medical; years rotating internship; now in third year residency in medicine, all at important teaching hospital; seeks industrial post because of pressing financial problem.

Staff Physician: (205) 30; M.D., Hahnemann Medical College; four years successful private general and surgical practice; one year, industrial staff physician; being separated, USNMC, January, 1954; interested only in industrial medicine in Philadelphia to Wilmington, New Jersey area.

Staff Physician: (206) 30; Category IV; M.D., Louisiana State Medical; rotating internship, one year; 18 months successful private general and surgical practice; prefers industry with regular hours; licensed, North Carolina, Indiana; 30 days.

Staff Physician: (207) 31; Graduate Class A school; five years, USAMC, (major); two years, residency, medicine; two years, plant physician, large company, metal stampings, fabrication; seeks post leading to medical directorship.

POSITIONS OPEN

Medical Director: (62) Assume complete charge medical program leading company; 17 plants; various sections; headquarters in New York City.

Medical Director: (63) Associate Medical Director; large machine tool manufacturing company; 7000 employees; four dispensaries; well staffed; large city; university medical center.

Medical Director: (64) Regional plant; large company; 4000 employees; excellent college town, Ohio.

Surgeon: (65) Chief; 150 bed hospital and eight infirmaries; will also assist in administrative duties; foreign operations of leading American Company; (Western Hemisphere); three year contract; income comparable to $24,000 U.S.; 3½% tax; prefer Spanish speaking, mature, Diplomate.

Staff Physician: (66) Mature, experienced industrial physician, capable of assuming administrative duties in absence of medical director; large industrial operation, excellent town 50,000 near university medical school; South.

Staff Physician: (67) As assistant to medical director; regional plant of very large company; 2000 employees; superior potential; South.

Staff Physician: (68) California plant of large company; fine town near university medical school.

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the teaching and research work of the schools. Prospects seem excellent for a real linkage of the groups concerned. It is a fact that the schools are not giving adequate attention to industrial medicine. The schools should make greater use of industry as a laboratory for training doctors. Such training should be largely concerned with preventive medicine and the management of the emotional problems of the employees. Industrial health conservation is the goal.

—*Medical Times*, Editorial, October, 1953.

Hearing Problems

CLINICS on hearing conservation in industry were held in Wausau, September 10, Oshkosh, September 24, and Racine, October 14, under the auspices of the Wisconsin Council of Safety, State Medical Society of Wisconsin, Wisconsin State Board of Health, Wisconsin Manufacturers Association, and the Wisconsin State Nurses Association. "Hearing Problems in Relation to Industrial Noise Exposure" were discussed at Wausau by Dr. Aram Glorig, Jr., Washington, D.C., and at Oshkosh and Racine by D. E. Wheeler, Ph.D., Los Angeles. Participants in a panel on "Responsibilities of Physicians and Nurses in an Industrial Hearing Conservation Program" were Drs. Thomas L. Tolan, Meyer S. Fox, and Paul T. Whitaker, and Miss Ruth Martineau, R.N., all of Milwaukee.

Executive Health

A HELPFUL reminder to watch that waistline. That's an addition to the luncheon menu in the executive dining room of Socony-Vacuum Oil, in New York City. For the last several months, the menu has been including a listing of caloric value alongside each food item. "This has resulted in much lively conversation and probably several tons of weight loss," said DR. GEORGE M. SAUNDERS, the oil firm's Medical Director, in a talk before the sixth annual Industrial Health Conference (at Houston, Texas, October 1-3, 1953) sponsored by a score of Texas health and industrial groups and chambers of commerce. DR. SAUNDERS' reference to the new executive-streamlining hint at Socony-Vacuum underscored his account of a number of desirable features of executive health programs in this country. The No. 1 requirement, DR. SAUNDERS said, is a careful periodic health inventory to "assess physiologic and emotional condition with special reference to demands of the job." He observed that some companies require such examinations only for top management, such as the president and directors. He endorsed, however, the plan of a growing number of companies reaching into lower management levels, and including, for example, department heads, superintendents and foremen. Voluntary physical examinations are more desirable, but, if necessary, the examinations should be made compulsory, as a matter of protection not only to the executive, but the company's stockholders as well. Special types of health programs are justified for executives, because "the er-

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rors an executive makes may endanger the jobs of hundreds or possibly thousands of his co-workers. Good health means fewer errors." A typically good plan for physcial examinations would include a check-up every two years for those between 30 and 40 years old; annually for the 40 to 60 age group, and semi-annually thereafter. Executive health programs in force today usually call for a half-day examination, though some companies put their top men in hospitals for a two or three-day physical inventory. "The ultimate value of the examination to the executive and to his company program is directly in proportion to the completeness of the examination."

—*Wall Street Journal.*

The Doctor and the Press

MEDICINE has attained the status of big news. This is merely another way of saying that health has become big news. Not many years ago, in terms of the life of the nation, the field of medicine was unproductive for the newsman. Health, while recognized as something to be valued, was not news in the dictionary sense of "new knowledge of something significant." But under the stimulus of an expanding population, in response to the transition from a simple agricultural society to a complex industrial one, and under the spur of scientific research and achievement, the matter of health has achieved wide reader interest. The space alloted to subjects bearing on health in periodicals and newspapers, in professional publications, on the radio and on television, attests the lively public preoccupation with health and the means of maintaining it. Food, shelter, and clothing no longer stand alone as the essentials of useful and satisfying living; they've had to move over to make room for health.

—CHARLES R. NICKLAS, Editor, *Chambersburg Public Opinion*, in *Pennsylvania Med. J.*, September, 1953.

In Quebec

THE Industrial Medical Association of the Province of Quebec held its Tenth Annual Meeting in Quebec, October 1-3, 1953. The subjects and speakers were as follows: "Nutrition of the Employee in Industry"—Doctor Honore Nadeau; "Resistance and Acclimatization to Cold"—Doctor Louis Paul Dugal; "Experimental Fatigue"—Doctor Andre Desmarais; "Industrial X-Ray, its Dangers, its Safety Measures"—Mr. Sarto R. Plamondon, P. Eng.; "Physiology of Work"—Doctor Georges Bergeron; "The Orientation of Pneumoconiosis"—Doctor J. A. Vidal; "Tuberculosis in Industry"—Doctor Philippe Landry; "Physiology of Alcohol"—Doctor Alexandre Bedard; "Psychosomatic Medicine applied to Industry"—Doctor Eustace Morin; "The Common Injuries of the Foot in Industry"—Doctor J. Ls. Larochelle; "Internal Traumatism of the Abdomen"—Doctor Vincent Gauthier; "Therapeutics in Industrial Dermatitis"—Doctor Richard Therrien; "X-Ray"—Doctor Jules Gosselin; "Rehabilitation"—Doctor J. M. Elliott; "Legal Aspects of Industrial Medicine"—Romeo Depeyre, M.D.

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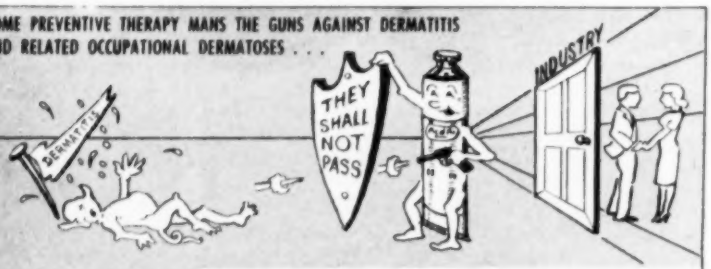
DOME PREVENTIVE THERAPY MANS THE GUNS AGAINST DERMATITIS AND RELATED OCCUPATIONAL DERMATOSES . . .



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Aluminum Legs

AT THE end of fighting in Korea, an estimated 15,000 to 20,000 ROK veterans who had lost legs in combat were bedridden for want of artificial limbs. Theirs was a special problem. Not only would the cost of standard artificial legs ($300 to $400 each) be prohibitive in such numbers, but the metal ball-and-socket joints would rust in the rice paddies where most Koreans earn their living. Rehabilitation specialists to lead the amputees back into a normal way of live were not available. To meet the problem, the American-Korean Foundation, of which Dr. Milton S. Eisenhower is chairman, has sponsored a rehabilitation center near Pusan and developed an aluminum artificial leg which will cost about $10 in mass production and will withstand exposure to water in the rice fields. Dr. Howard Rusk, director of the New York University-Bellevue Institute of Physical Medicine and Rehabilitation, laid down the specifications for the artificial leg; the insti-

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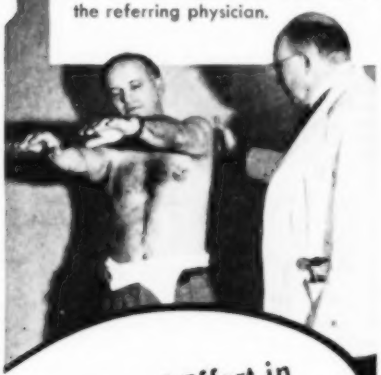

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tute's director of prosthetics, William Tausberg, developed it. First models cost around $20, and 100 were sent to Korea for final testing prior to mass production. Three nurses already are on the job at the Pusan rehabilitation center, with more to follow.

—*Look Magazine.*

The Employer Pays

PHYSICIANS are interested of course in the sociological and economic effects of the various union plans for medical care on the private practice of medicine. An important item for consideration is the fact that 42% of all medical care in the United States is now paid for by someone other than the patient: Government agencies, including county, state and Federal, Veterans Administration, and welfare agencies pay for 20% of all services; 20% more is paid for by employers; 2% by philanthropic institutions. If the rate of growth continues it is logical to assume that as high as 70% of medical services will be paid by someone other than the patient. Since management now has about 30% of its payroll covering fringe benefits, management is beginning to take far more interest in what the employee gets for the money paid out, and will be far more concerned about medical care, since almost all union-negotiated contracts call for payment of all the cost by the employer.

—From "Union Labor Health and Welfare Insurance Plans," by SAMUEL R. SHERMAN, M.D., in *California Medicine*, September, 1953.

Number One Killer

EACH year the American public pays a frightful price in lives, pain, and cash for accidents which appear to be part and parcel of the technicological development of this country. The increase in power and speed of machinery, and working at great heights and depths, have brought with them an increase in the magnitude of injuries, both in gravity and multiplicity. The National Safety Council added up the bill this way for 1952: killed —96,000; injured—9,700,000; cost —$8,300,000,000. The magnitude of this problem can be realized only when we appreciate the fact that the accidental death toll on the home front, in 1952, was four times as great as the toll of American dead on the Korean battlefields since the onset of the Korean conflict. The number-one

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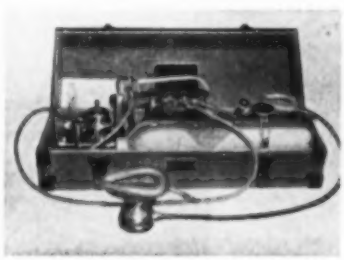

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[1]*Jl. Inv. Derm.*, 17:125 (Sept., 1951)

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killer in the United States is the motor vehicle, and apparently that is here to stay. Many agencies have been set up throughout the country in a sincere effort to cut down the appalling number of automobile accidents, but, regardless, of these many efforts, the traffic death toll in the past year has increased in 27 of the 48 states.

—From "The Significance of Multiple Injuries in Relation to the Surgery of Trauma," by CARLETON MATHEWSON, JR., M.D., in *Nebraska State Med. J.*, October, 1953.

Sickness Survey Report

IN MIDSUMMER, results of its first "Sickness Survey" were mailed out by the Washington State Medical Association. This project, the first of its kind in the nation, was sponsored jointly by the Association and the University Medical School. The purpose of the survey, held on January 20 of this year, was to obtain an accurate picture of illness as it is actually encountered in private practice in the state. Numerically, the largest number of visits, 17.5%, was the group not specifically related to sickness, such as those for prenatal and postnatal care, physical examinations, and immunizations. A close second was diseases of the respiratory system, which accounted for 17.4% of all visits by physicians. The cause for visits which ranked third was fractures, sprains and other externally caused damage to the locomotor system. This somewhat surprising result serves to emphasize once again today's high accident rate. This enter-

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Vainder, Milton: Indus. Med. & Surg. 22:183 (Apr.) 1953

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prising state medical association was quick to point out that the high incidence of respiratory illness on January 20 emphasizes the need to repeat the survey, according to plan, four times during the year to allow for seasonal variation. The results of this preliminary survey invite continuation of the project and offer a suggestion to other state associations to do likewise.

—*J. Florida Med. A.*, October, 1953.

Fitness to Fly

PROBLEMS of pilot aging were described to Indiana doctors, meeting in French Lick, by Dr. W. R. Stovall, medical division chief of the Civil Aeronautics Administration. Detection of organic defects which may cause or contribute to pilot failure presents a task of grave complexity, he pointed out. More than 1,000 civil airmen holding licenses today, some of them in airline service, are beyond age 60. Dr. Stovall cited results of a survey made of 4,537 commercial pilots with accident records and 57,883 fliers who had figured in no reportable mishaps. In the former group, the proportion having cardiac arrhythmias was four times as great; vascular defects, eight times; bone and joint diseases, six times as great. Aero Medical Association, of which Dr. Stovall is immediate past-president, is intensifying its drive toward establishment of a commission that would bring aviation industry, organized pilots, medicine and governmental authority together in a concerted effort. If government's Air Coordinating Committee approves the commission idea—which, incidentally, was advocated by the Doolittle committee that investigated the series of Newark Airport crashes in 1951—a comprehensive study of flying fitness is virtually certain to ensue.

—*Washington Report on the Medical Sciences*, No. 333, October 26, 1953.

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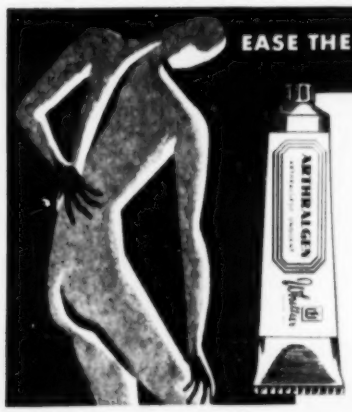
Eczema

THERE are seven types of eczema known today: (1) Nonsensitization eczema is caused by physical or chemical injury; can result from exposure to light, heat, cold, friction or strong chemicals; most frequently is found on the exposed parts of the body where the skin might be rubbed. (2) Sensitization or contact eczema always results from contact with a substance or substances to which the skin has become allergic or sensitized by previous exposure. This is the commonest form of eczema —the type from which workmen and housewives most frequently suffer. (3) Infectious eczema is almost always secondary to some infection, and occurs when the skin is damaged by pus and the cells have become sensitized or irritated by bacteria or bacterial toxins. (4) Varicose eczema is associated with poor circulation of the blood, often combined with infection. (5) Atopic eczema, a form of neurodermatitis, is most frequently found in people under 20 years of age although adults are by no means immune; generally begins in childhood and often is associated with hay fever and asthma. (6) Nummular eczema is found chiefly in adults. Although the exact cause is unknown, it is associated with an unquiet, worried mind. (7) Infantile eczema is seen most often in babies under one year of age, and is the result of allergy to food or things in a babies' environment such as clothing or object he touches. "All forms of eczema may be either acute or chronic, and they may be further aggravated by external irritants other than the specific original cause. All too often the type of eczema is wrongly diagnosed by the patient, the druggist, or well-meaning friends. The numerous ointments and lotions applied only serve, in most cases, to worsen the disease, so that the last stages of eczema are more serious than the first. The best and most important advice which can be given is negative: 'Beware of drugstore or home remedies and treatments.' Put yourself in the hands of a qualified dermatologist."

—AMA News Release, October 2, 1953, on an article by ROBERT P. LITTLE, M.D., and S. G. MULLINS, in *Today's Health*.

With Encouragement

WHEN workers have little interest in their jobs, they perform their work on the basis of habit. Morale plummets, waste ensues, profits suffer. Chances are that the operations will be done in the easiest ways, rather than the quickest or most efficient. Habit is the worst enemy of production, because it removes the chance for improvement. Habit is a substitute for thinking. How do you make workers think? It is seldom easy; it requires a great deal of continuous effort. The first step is to instill interest in the job. There can be no interest unless the job has meaning. Employees must understand the full significance of their work—why certain records are produced, how they are used, how they affect the company's welfare. Once a worker understands this, his job becomes a vital part of his life; his performance is bound to improve and you can't stop him from thinking about his job. With encouragement, he will have all sorts of ideas for simplifying, improving and increasing production. —*Office Executive*, May, 1953.



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The Older Cardiac Patient

THE report concerns persons who are 55 years of age or over at the time heart disease develops. Records of 580 patients revealed that many patients with cardiac defects in the sixth and seventh decades of life can and do work successfully. Although continued employment does not have any adverse effect on the course of heart disease, the employment of the cardiac patient over 55 is less successful than that of the younger person with heart disease. The cardiac capacity of patients whose heart disease develops after 55 years of age is usually initially diminished to a greater extent than that of younger cardiac patients. Selective job placement presents greater problems in elderly persons. A study of the employment needs of 33 patients over 55 years of age with degenerative heart disease showed that 20 were working and six more were considered employable; only seven were unable to work because of cardiac disability. This study and statistical analyses indicate that counseling and placement agencies should interview all cardiac patients whom the physician considers employable. Physicians should supplement the functional and therapeutic classifications with specific recommendations concerning hour per day or per week, and amounts of carrying, lifting, walking, and traveling a patient can do. Through selective placement, and with a reasonable amount of medical supervision, a considerable proportion of cardiac patients in the sixth and seventh decades can remain in useful employment.

Abs. in *J.A.M.A.*, of "Occupational Potentialities of the Older Cardiac Patient," by L. J. GOLDWATER and B. KRESKY, in *Geriatrics*, May, 1953.

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Industrial Medicine Program

A SYMPOSIUM, "Dangers of Solvent Handling" was presented before the section on industrial medicine and hygiene of the annual Greater Cincinnati Safety Conference, November 17. The speakers included Floyd A. Van Atta, Ph.D., director of industrial hygiene, National Safety Council, whose topic was "Toxicity of Solvents"; Dr. Edward A. Gall, professor of pathology, University of Cincinnati College of Medicine, who discussed "The Effects of Solvent Absorption on the Human Body"; and Dr. Donald J. Birmingham, Division of Occupational Health, USPHS, who presented "The Effects of Solvents on Human Skin." A panel discussion on safe handling of solvents completed the program. Co-chairmen for the section meeting in Parlor H, Hotel Sheraton-Gibson were Dr. James P. Hughes, Bureau of Industrial Health of the Cincinnati Health Department, and Miss Margaret Carnine, R.N., Trailmobile, Inc.

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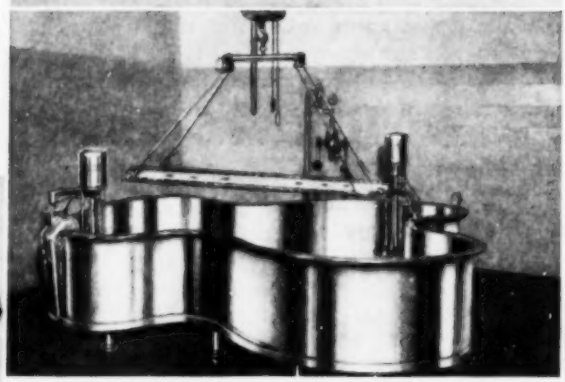

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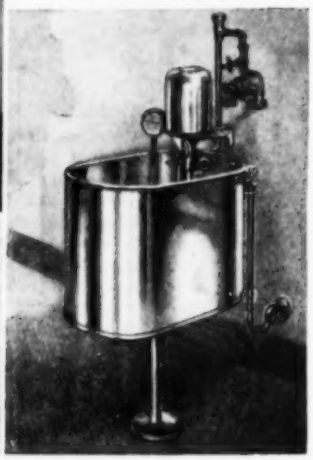

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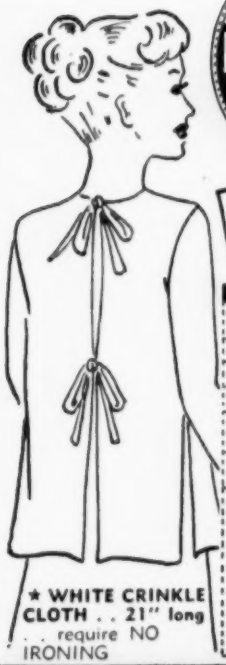

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1. Crunden, A. B., Jr., and Davis, W. A.: Am. J. Obst. & Gynec. 65:311, 1953.

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1. Behrman, H. T., Combes, F. C., Bobroff, A., Leviticus, R.: Ind. Med. & Surg. 18:512, 1949.
2. Turell, R.: New York St. J. M. 50:2282, 1950.
3. Heimer, C. B., Grayzel, H. G., and Kramer, B.: Archives Pediat. 68:382, 1951.

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REFERENCES:
1. Gastric Tolerance for Aspirin and Buffered Aspirin. Ind. Med. 20:480, Oct. 1951.
2. Effect of Buffering Agents on Absorption of Acetylsalicylic Acid. J. Am. Pharm. Assoc., Sc. Ed. 39:21, Jan. 1950.

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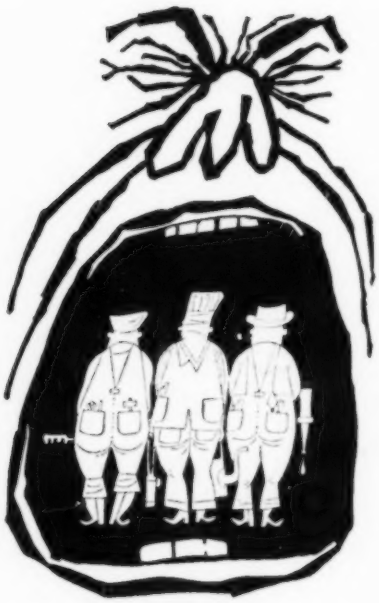

now

not **3** *but* **4**

antitussive

agents

combined for control of severe cough

Pyribenzamine Expectorant is now available with codeine for control of severe cough, both allergic and nonallergic. Palatable and easy to administer, this new antitussive combination offers these therapeutic advantages:

1 **Codeine inhibits cough reflex,** exerting a marked sedative influence on the cough center, without producing general sedative effects.

2 **Congestion, irritation relieved** by the histamine-antagonizing action of Pyribenzamine, effective throughout the entire respiratory tract.

3 **Bronchiole-relaxing action** of ephedrine tends to lessen severity of cough spasms, makes breathing easier.

4 **Liquefying action** of ammonium chloride "loosens" bronchial secretions, aids productive expectoration, soothes bronchial membranes.

Each 4-ml. teaspoonful of Pyribenzamine Expectorant with Codeine and Ephedrine contains 50 mg. Pyribenzamine citrate (tripelennamine citrate Ciba), 8 mg. codeine phosphate, 10 mg. ephedrine sulfate, and 80 mg. ammonium chloride. ***Also available:*** Pyribenzamine Expectorant plain—same formula minus codeine phosphate. Both preparations supplied in pints and gallons.

CIBA PHARMACEUTICAL PRODUCTS, INC., SUMMIT, NEW JERSEY

now

Pyribenzamine®
Expectorant... *with codeine*

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